

REVISION OF THE GENUS EUSCHISTUS IN MIDDLE
AMERICA (HEMIPTERA, PENTATOMIDAE,
PENTATOMINI)

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ABSTRACT: The species of *Euschistus* known from Middle America, and those from adjacent regions that may occur there, are described and keyed. Thirty-six species are included, 13 of them new species: *Euschistus achatadus*, *E. agudus*, *E. chiapus*, *E. egglestoni*, *E. leonensis*, *E. quadrator*, *E. subinteger*, *E. ruckesi*, *E. schaffneri*, *E. stali*, *E. vetus*, *E. zafadus*, and *E. zagus*. One new subspecies, *E. crenator orbicularis*, is described.

New combinations are *Padaeus teapensis* (Distant), 1890, and *Mormidea integella* (Distant), 1893, both species removed from *Euschistus*.

Euschistus verrucifer (Stål, 1872) is returned to *Padaeus* Stål, 1862, the genus in which it was described originally.

New synonymy recognized is *Euschistus trisinuatus* Stål, 1872, as a synonym of *E. atrox* (Westwood), 1837; *E. capitatus* Distant, 1890, as a synonym of *E. biformis* Stål, 1862; *Pentatomia crocipes* [Westwood], 1837, *Euschistus proximus* Dallas, 1851, and *E. reductus* Walker, 1867, as synonyms of *E. crenator* (Fabricius), 1794; *E. quadrimaculatus* Distant, 1887, as a synonym of *E. heros* (Fabricius), 1798; *E. impictiventris* Stål, 1872, as a synonym of *E. servus* (Say), 1832; and *E. zopilotesensis* Distant, 1890, as a synonym of *E. strenuus* Stål, 1862.

A lectotype and paralectotypes are designated for *E.*

trisinuatus Stål, *E. rugifer* Stål, 1872, and *E. zopilotensis* Distant, 1890.

The subgenus *Paraschistus* Kirkaldy, 1909, proves to be neither a natural nor convenient division and is placed in the synonymy of the nominate subgenus.

INTRODUCTION

The genus *Euschistus* has grown by accretion since its erection (Dallas 1851) until it is now the largest of the pentatomine genera. The principal taxonomic literature pertaining to Middle American *Euschistus* species, subsequent to the work of Dallas, consists of a century old synopsis by Stål (1872), a few illustrations by Distant (1880-93) and original descriptions of species. The sum of the literature does not permit recognition of all the named species. Consequently, some synonymy and many undescribed species have gone unrecognized, and identification of even the agriculturally important species is often uncertain.

This contribution toward a generic revision is offered with the misgivings that it may contain a few errors of fact and the realization that it is probably incomplete, but with the expectation that the descriptions, figures and keys will permit identification of the known species of *Euschistus* occurring in Middle America (Mexico and Central America).

A key is provided to separate the Middle American genera that are most likely to be confused with *Euschistus*, as well as another to the species of *Euschistus* known from Middle America including those from adjacent regions that may occur in Middle America. For each species there is a description or redescription, the latter abbreviated if the species has been described or redescribed recently in a readily available journal.

KEY TO GENERA OF SIMILAR APPEARANCE

Nearly all *Euschistus* species have a general conformity in appearance that permits proper generic placement on the basis of familiarity with a few species. Since the genus has representatives of economic importance almost everywhere in the Western Hemisphere, it is one of the most widely recognized of the hemipteran genera. Nevertheless, in Middle America there are a few species in neighboring genera that may be mistaken for *Euschistus* because of similarity in color, size and general appearance. The following key separates these genera from *Euschistus* and from each other only in Middle America.

1. Femora armed with pair of stout preapical tubercles *Sibaria*
- 1'. Femora unarmed or bearing double row of low tubercles 2
- 2(1). Tylus and juga usually subequal in length, any difference little or
no greater than width of tylus at apex 3
- 2'. Tylus much longer or much shorter than juga 8
- 3(2). Double row of low tubercles, each bearing a seta, on inferior face
of femora, best developed on anterior femora; costal margin of
hemelytra obtusely denticulate toward base *Agroecus*
- 3'. Femora setose, otherwise unarmed; costal margin of hemelytra
without denticles 4
- 4(3). Length of basal segment of antennae subequal to distance from
its base to apex of head 5
- 4'. Basal segment of antennae much shorter *Tibraca*
- 5(4). Bucculae evanescent or truncate at base of head *Euschistus*
- 5'. Bucculae prolonged into lobe at base of head 6
- 6(5). Anterolateral margins of pronotum rounded, smooth or vertically
rugose; humeral angles acutely produced *Padaeus*
- 6'. Anterolateral margins of pronotum carinate, entire; humeral angles
obtusely rounded 7
- 7(6). Head deeply inserted into pronotum, imaginary line drawn across
anterior limits of pronotum bisecting each eye near middle
..... *Meneclis*
- 7'. Imaginary line drawn across anterior limits of pronotum passing
near posterior margin of each eye *Hymenarcys*
- 8(2). Tylus spinosely produced far beyond juga 9
- 8'. Tylus much shorter than juga 10
- 9(8). Eyes contiguous with pronotum; anterolateral pronotal margins
denticulate *Berecynthus*
- 9'. Eyes not touching pronotum; anterolateral pronotal margins
smoothly rounded *Proxys*
- 10(8). Juga convergent or contiguous before tylus; black tubercle in
basal angles of scutellum *Galedanta*
- 10'. Juga dehiscent, acute apically; without tubercles in basal angles of
scutellum *Dichelops*

GENERIC CHARACTERS OF *EUSCHISTUS*

Euschistus Dallas, 1851

Euschistus Dallas, 1851, p. 193.—Stål, 1867, p. 528.—Stål, 1872, p. 23.
—Van Duzee, 1904, p. 43.—Kirkaldy, 1909, p. 63.—Torre-Bueno,
1939, p. 219.

Paraschistus Kirkaldy, 1909, p. 63 (as subgenus). **New Synonymy.**

Dorsum drably colored in hues of yellow, brown or black, some-
times inconspicuously suffused in part with dull shades of red. Ventral
surfaces similarly but usually more lightly colored, occasionally

flecked with red, in some species green in life; appendages often tinted in part with pale red. Punctuation moderate in density and depth, evenly to somewhat irregularly distributed; dorsal punctures predominantly light castaneous to black; ventral punctures concolorous with or darker than sclerites.

Length of body without membrane of hemelytra 6.9–14.1 mm.

Head approximately as long as wide across eyes; lateral margins sigmoid before eyes, narrowing toward rounded apex, often subparallel for middle third of distance from eyes to apex. Jugal usually nearly equal to tylus in length, often slightly longer, rarely contiguous at apex, occasionally a little shorter, never acute at apex. Ocelli located between and well behind reticulated part of eyes; distance across ocelli subequal to or somewhat greater than half distance across eyes. Antenniferous tubercles largely exposed from above, obtusely toothed laterally at apex. Basal segment of antennae nearly reaching to slightly surpassing apex of head; remaining four segments longer than first. Bucculae near anterior limits usually produced ventrad into obtuse tooth, extending more or less percurrently to base of head, there evanescent to truncate. Rostrum extending between or slightly past metacoxae; apex of basal segment nearly reaching to slightly surpassing termination of bucculae; second segment much longer than others, its apex falling between procoxae and mesocoxae; third and fourth segments approximately equal in length.

Pronotum at meson nearly to almost half again as long as head; width across humeri about 2.3 to 3.3 times length. Emargination of anterior margin, behind vertex of head, broad, moderately deep. Anterolateral margins entire or, before humeri, undulating, denticulate or vertically rugose. Humeri weakly to strongly produced, broadly rounded to spinose, sometimes considerably elevated above disk.

Scutellum subequal in length and basal width, or somewhat longer than wide. Lateral margins narrow rapidly in gently convex arcs, along frena, for 0.5 to 0.7 of distance from base to apex, then gradually converge toward moderately to narrowly rounded apex. Small to moderate sized fovea usually present in basal angles.

Hemelytra leave connexiva slightly to rather broadly exposed; coria with inner angle rounded near apex of scutellum, posterior margin oblique, outer angle acute. Membrane vitreous, sometimes with numerous small dark spots, to darkly translucent, nearly covering to considerably surpassing apex of abdomen; venation simple to reticulate.

Pleural region on each side frequently marked with five dark spots: one at anterolateral angle of prothorax, another on meso-

pleuron at dorsal end of supracoxal cleft, one at base of each subcoxae on pleural suture; spots on subcoxae and auricle of ostiole all in line; one or more of five spots sometimes obscure or obsolete. Evaporative area on each side rugose, matte, uniformly colored or flecked with red or contrastingly punctate, covering much of metapleuron, extending onto mesopleuron, reaching about halfway or somewhat less from auriculate ostiole to lateral margin of metapleuron. Prosternum and metasternum nearly flat or shallowly sulcate beneath rostrum. Anterior portion of mesosternum with weak median carina that expands laterally along anterior margin. Femora setose but otherwise unarmed; fore tibiae provided with tuft of setae about two-thirds distance from base toward apex; all tibiae sulcate. Abdomen without median tubercle or spine at base.

SYNONYMY: Only three Middle American species assigned to *Euschistus* have been placed in other than the nominate subgenus. One of these, *E. spurculus*, was described by Stål (1862) in the subgenus *Lycipta*, but a decade later Stål (1872) correctly relocated this species in the nominate subgenus.

Kirkaldy (1909) created the subgenus *Paraschistus* to contain *E. integer* Stål and *E. integellus* Distant, apparently because of all the species then included in *Euschistus* these alone were seemingly characterized by having the anterolateral pronotal margin entire. After examining the type of *Euschistus integellus* Distant, I am confident that this species should become *Mormidea integella* (Distant), leaving for consideration only *E. integer*, the type species of *Paraschistus*.

The single character purporting to distinguish the subgenus *Paraschistus* from congeners, the lack of denticulation on the anterolateral pronotal margins, is not entirely consistent. The degree of denticulation of these margins varies somewhat within some species of the genus as well as among species. In some specimens of *E. integer* the apical portion of the anterolateral pronotal margins undulates as it does in some specimens of a few congeners that usually have these margins at least weakly denticulate, *E. spurculus* for example. As a result, *Paraschistus* cannot be separated cleanly from the nominate subgenus. In other respects, *E. integer* shows no greater dissimilarity from congeners than is to be expected among species. It seems, therefore, that *Paraschistus* is neither a natural nor a convenient taxon, and it should not stand. All Middle American species of *Euschistus* should be placed in the nominate subgenus.

SPECIES TRANSFERRED TO *PADAEUS* STÅL, 1862

Euschistus verrucifer (Stål), 1862 and *E. teapensis* Distant, 1890, both described from Middle America, are transferred to the genus *Padaeus* Stål, 1862. Stål erected this genus to contain *Mormidea viduus* Vollenhoven, 1868, and *Padaeus verrucifer*, but he later (1872) moved *P. verrucifer* to *Euschistus* while adding *P. trivittatus*. A translation of Stål's short generic description of *Padaeus* (Stål, 1862, p. 101) is pertinent:

"Body oval, quite convex beneath. Head triangular, center lobe slightly longer than lateral [lobes]; bucculae percurrent, abruptly abbreviated posteriorly. Basal segment of rostrum slightly shorter than bucculae, second shorter than two apical segments together. Apex of scutellum quite narrow. Mesosternum carinate. Abdomen slightly wider than hemelytra. Legs unarmed.

"A genus akin to *Euschistus*."

Distant, 1880, added to this (p. 61) ". . . the margins of the pronotum are not denticulated; and the anterior tibiae only are sulcated . . ."

The critical character in Stål's generic description is the form of the bucculae, since the remaining characters together apply equally well to several *Euschistus* species. Viewed laterally, the bucculae of *Padaeus* species actually extend as a lobe at the base of the head, while in *Euschistus* species the bucculae are evanescent or, less commonly, truncate posteriorly. Distant's observation regarding the pronotum is both accurate and pertinent, but he erred in stating that the middle and posterior tibiae of *Padaeus* species lack a sulcus.

P. viduus, the type species, *P. verrucifer* and *P. teapensis* all have the bucculae surpassing the basal segment of the rostrum and terminating in a lobe at the base of the head, and all have vertical rugae rather than denticles along the rounded anterolateral pronotal margins. These species also agree in all other respects with the original description of the genus *Padaeus*.

INTRASPECIFIC VARIATION

The somber hues of *Euschistus* species severely limit the possibilities of conspicuous variation in coloration. However, melanistic forms do occur in a few species, *E. biformis* for example, and in several species the ventral surfaces are sometimes entirely or partially flecked with pale red. Annular markings on the antennae are generally

stable, but minor markings on the appendages and maculae on the abdominal sternites are subject to considerable variation.

Mostly early hemipterists, working with few specimens, attached much significance to the interspecific differences that they observed in the proportionate length of antennal segments. Unfortunately, these proportions are often variable and of little diagnostic value. In most species the length of the tylus relative to the jugs is rather uniform, but in a few species this relationship is variable.

The humeri of several species vary notably in the degree to which they are produced laterally and, hence, in the form of the humeral angle. This variation is correlated with season in *E. tristigmus* (Say), but the extremes in some species have been collected together on widely separated dates.

TAXONOMIC VALUE OF THE GENITALIA

The male genitalia have easily discernible interspecific differences and with few exceptions show little intraspecific variation. Consequently, the sclerotized parts are useful in establishing the identity of all species and are the only convenient means of separating some of them. The structure of the genital cup is usually sufficient to separate the species, and this can be examined with little or no preparation of the specimen. Additional characters are available by removing the parameres and parts of the genitalia within the pygophore.

The conjunctiva, median penal lobes, penisfilum, theca and thecal processes differ interspecifically. However, the form of the membranous conjunctiva, and to a much lesser extent that of the median penal lobes, varies according to the degree of inflation attained during the maceration process. Conjunctival lobes may have been overlooked where few specimens were available for dissection. Consequently, little importance is attached to the form of the conjunctiva as a means of discriminating among species. The penisfilum is often, even usually, displaced from its normal position during dissection. Only its general form, length, and place of emergence are significant.

The female genitalia have not been surveyed methodically. The genital plates are seldom taxonomically helpful, but the spermatheca differs among the few species that were examined. The differences are sometimes more subtle than those found in the male genitalia and the risk of erroneous interpretation is correspondingly greater. Use of the spermatheca for identification is unlikely to become routine practice in the genus since its removal is a tedious process that results in some mutilation of the specimen.

The genus cannot be delineated on the basis of the genital charac-

ters of either sex. The general construction of the spermatheca is substantially the same as that in such distantly related genera as *Lopadusa* Stål (Becker and Grazia, 1970) and *Chloropepla* Stål (Grazia, 1968). Intrageneric differences among males surpass the differences between some species of *Euschistus* and some species of neighboring genera.

DISSECTION OF GENITALIA

Most of the characters used to distinguish among the species are in plain view, but often the pygophore must be extracted from beneath the membrane of the hemelytra to see clearly the structures within the genital cup. This may be done quickly by immersing the specimen for a minute or two in nearly boiling water, then pulling gently on the pygophore with fine forceps until the genital cup is exposed. Dissecting the genital structures from within the pygophore is not a particularly formidable task in this genus. The pygophore is extracted as above, detached from the abdomen, and the tissues macerated in a 10 per cent solution of potassium hydroxide. Allowing the pygophore to stand overnight in cold caustic solution produces the best results, but maceration in hot caustic is much faster and usually satisfactory. The pygophore is transferred for dissection from the caustic solution into water made weakly acid to arrest further maceration. The proctiger should pull free easily. The basal plate and theca may then be pushed into the genital cup, working through the orifice at the base of the pygophore, and removed before detaching the parameres.

USE OF DRAWINGS

Since the illustrated structures are irregular forms, their appearance from various aspects differs substantially. Careful orientation of the specimens is therefore requisite for meaningful comparison with the drawings.

Illustrations of the pronotum were made with the anterior and posterior margins on the same focal plane at the meson and the apex of both humeral angles on a parallel focal plane.

Part of the pygophore is illustrated for most species from caudal, ventral and dorsal views. These drawings were made from specimens oriented as follows: caudal view with the dorsal surface of the pygophore at the sides of the genital cup perpendicular to the focal plane; ventral view with the anterior and posterior margins of the pygophore on the same focal plane at the meson; dorsal view with the surface

of the pygophore at the sides of the genital cup on the same focal plane.

The bases of the parameres serve as a reference in the orientation of this structure.

The genital plates of the female were drawn with the anterior margin of the first gonocoxa and the apical margin of the ninth paratergite on the same focal plane.

The terminology used is that of McDonald (1966).

KEY TO *EUSCHISTUS* SPECIES OF MIDDLE AMERICA

1. Prominent impunctate fascia present intramarginally on each side of scutellum; similar but less pronounced fascia lying behind cicatrices and along veins of coria *E. lineatus* Walker
- 1'. Without these impunctate fasciae 2
- 2(1). Lateral margins of abdomen narrowly subcalloused and much paler than adjacent abdominal disk *E. comptus* Walker
- 2'. Lateral margins of abdomen neither subcalloused nor much paler than adjacent abdominal disk 3
- 3(2). Membrane of hemelytra with numerous small dark spots 4
- 3'. Membrane of hemelytra unspotted 7
- 4(3). Spiracles black *E. zagus*, new species
- 4'. Spiracles nearly concolorous with surrounding area of sternite 5
- 5(4). Evaporative areas punctate with black; conspicuous impunctate fascia traversing pronotum between humeri .. *E. crassus* Dallas
- 5'. Evaporative areas not punctate with black; pronotum lacking well-defined impunctate fascia 6
- 6(5). Projection of superior ridge entire above proctiger (Fig. 291); abdominal venter usually clearly marked with large black longitudinally elongated median spot on one or more segments *E. tristigmus* (Say)
- 6'. Projection of superior ridge above proctiger notched mesially on free margin (Fig. 202); abdominal venter lacking large black median spots *E. servus servus* (Say)
- 7(3). Basal third of costal margin of coria plainly reflexed; anterolateral margins of pronotum broadly reflexed *E. schaffneri*, new species
- 7'. Costal margin of hemelytra not reflexed, or reflexed only at very base; anterolateral pronotal margins narrowly or not at all reflexed 8
- 8(7). Anterolateral margins of pronotum entire, or undulating, or with very obtuse low denticles on anterior half or less (Figs. 58-59, 130, 188-189, 251) 9
- 8'. Anterolateral margins of pronotum strongly denticulate at least on anterior third 12

- 9(8). Apical two antennal segments entirely black; apex of scutellum not pale *E. spurculus* Stål
- 9'. Apical two antennal segments rufous to brown or with pale basal ring; apex of scutellum pale at least along margin 10
- 10(9). Apical two antennal segments fuscous excepting yellowish brown ring on basal fourth of each segment *E. chiapus*, new species
- 10'. Apical two antennal segments almost uniformly brown or rufous 11
- 11(10). Humeri right angular (Fig. 251); inferior ridge entire (Figs. 253) *E. subinteger*, new species
- 11'. Humeri rounded (Fig. 130); inferior ridge with median notch (Figs. 131, 132) *E. integer* Stål
- 12(8). Membrane of hemelytra appearing brown against white paper inserted beneath membrane 13
- 12'. Membrane of hemelytra clear or fumose 18
- 13(12). Ventral surfaces including evaporative areas contrastingly black punctate 14
- 13'. Ventral surfaces pale yellow to black, concolorously punctate ... 16
- 14(13). Very apex of scutellum reflexed on each side of a narrow median longitudinal depression *E. zafadus*, new species
- 14'. Apex of scutellum nearly flat 15
- 15(14). Meson of pronotum narrowly calloused, pale; bucculae near anterior limits without an obvious tooth *E. achatadus*, new species
- 15'. Meson of pronotum neither calloused nor pale; bucculae near anterior limits with an obtuse tooth directed ventrad *E. ruckesi*, new species
- 16(13). Spiracles black or ringed with black; venter brownish yellow to black *E. bififormis* Stål
- 16'. Spiracles concolorous with yellowish venter 17
- 17(16). Humeral angles strongly produced upward as well as outward (Figs. 18-19); tylus slightly exceeding juga; dorsum without pale calloused spots *E. agudus*, new species
- 17'. Humeral angles less elevated above pronotal disk; juga longer than tylus, convergent (Fig. 10); pale calloused spot present on posterior margin of each cicatrice near mesial boundary; similar spots scattered on pronotum, scutellum and hemelytra *E. acutus* Dallas
- 18(12). Evaporative areas contrastingly punctured with black 19
- 18'. Evaporative areas unicolorous or flecked with red 22
- 19(18). Denticles on anterolateral margins of pronotum small, blunt, peg shaped, widely spaced; tylus surpassing juga by about width of tylus at apex of juga (Fig. 170) *E. rufimanus* Stål
- 19'. Denticles on anterolateral margins of pronotum mostly angular and closely spaced; tylus extending little or not at all beyond juga 20

- 20(19). Apex of scutellum ivory; membranes between abdominal sternites black between imaginary line connecting spiracles on each side, contrasting with yellowish sternites; three diffuse, often weak, longitudinal vittae on venter, one mesial, one on each side covering mesial end of pseudosuture *E. heros* (F.)
- 20'. Apex of scutellum not conspicuously paler than disk, or only very margin paler; intersegmental membranes of abdominal venter usually darker than sclerites but not fuscous or black; abdominal vittae usually lacking 21
- 21(20). Posterior margin of pygophore trisinuately emarginate from caudal view (Fig. 28); disk of pronotum weakly convex before humeri from lateral view (Fig. 31) *E. atrox* (Westwood)
- 21'. Posterior margin of pygophore with one moderately deep emargination from caudal view (Fig. 147); pronotal disk moderately convex before humeri from lateral view (Fig. 150) *E. nicaraguensis* Rolston
- 22(18). Numerous blackish spots scattered on hemelytra; narrow, sparsely punctate, transverse fascia between humeri; pronotum before fascia and head thickly punctate, darker than remainder of dorsum *E. obscurus* (P.B.)
- 22'. Hemelytra without spots, or if marked with a few spots then not punctate and colored as above 23
- 23(22). Posterior margin of pygophore conspicuously protruding in lateral view (Fig. 218); spiracles usually black *E. stali*, new species
- 23'. Posterior margin of pygophore smoothly contoured from lateral view; spiracles concolorous with surrounding area of sternite 24
- 24(23). Inferior ridge of pygophore paralleling posterior margin, separated from it by narrow sulcus (Figs. 40, 182); most denticles on anterolateral margins of pronotum widely separated, subacute, inclined toward humeri (Figs. 35-37, 179) 25
- 24'. Inferior ridge of pygophore not paralleling posterior margin; denticles closely spaced, neither inclined toward humeri nor subacute 26
- 25(24). Membrane of hemelytra with large brownish spot at inner angle; veins in part reticulate; scutellar disk rough, tumid; pronotum with transverse, sparsely punctate, calloused fascia between humeri *E. rugifer* Stål
- 25'. Membrane of hemelytra lightly fumose; veins not reticulate; scutellar disk often somewhat uneven, gently convex; pronotum with no more than obscure fascia between humeri *E. bifibulus* (P.B.)
- 26(24). Posterior margin of pygophore trisinuately emarginate in caudal, ventral and dorsal views (Figs. 296-298) *E. vetus*, new species

- 26'. Posterior margin of pygophore not trisinate in all of above aspects 27
- 27(26). Middle half of posterior margin of pygophore with moderately deep, evenly concave emargination in caudal view (Fig. 20) *E. agudus*, new species
- 27'. Emargination of posterior margin of pygophore differently shaped or lacking 28
- 28(27). Posterior margin of pygophore with a broad, shallow, sinuous to subrectangular emargination in ventral aspect (Figs. 115–116) *E. emorei* Rolston
- 28'. Posterior margin of pygophore not as above 29
- 29(28). Posterior margin of inferior ridge in dorsal view forming very open V with arms directed anterolaterad; superior ridge little produced above proctiger (Figs. 226, 236, 245); denticulate margins of pronotum and denticles often much paler than disk 31
- 29'. Posterior margin of inferior ridge arched evenly or sinuously cephalad in dorsal view (Figs. 263, 88); superior ridge produced posteriorly above proctiger, with broad sinuous emargination or notch (Figs. 264, 89); denticulate margins of pronotum and denticles usually as dark as or darker than disk .. 30
- 30(29). Genital cup with deep, transverse oval or reniform mesial impression defined anteriorly and laterally by inferior ridge; superior ridge notched mesially (Fig. 89) *crenator* group .. 34
- 30'. Excavation of genital cup between inferior ridge and posterior margin not limited to deep mesial impression, smooth, or with low protuberances or longitudinal sulcus at posterior margin; superior ridge broadly and sinuously emarginate (Fig. 264) *sulcacitus* group 36
- 31(29). Narrow punctate line along meson on tongue of scutellum bordered on each side by narrow impunctate or very sparsely punctate fascia; vague macula in center of disk of scutellum, another along border on each side at inner angle of corium *E. leonensis* Rolston
- 31'. Tongue of scutellum rather uniformly punctate and colored except narrow border of apex; disk without macula 32
- 32(31). Humeral angles acute (Fig. 242) *E. strenuus* Stål
- 32'. Humeral angles bluntly rounded to obtusely angulate (Figs. 223, 241) 33
- 33(32). Width of pronotum at humeri seldom exceeding 5.4 mm in males; small denticle on lateral walls of genital cup usually more prominent than obtuse denticular production above it on rim of genital cup (Fig. 245) *E. strenuus* Stål
- 33'. Width of pronotum at humeri seldom less than 5.5 mm in males; denticle on lateral walls of genital cup usually less prominent than production on rim of genital cup (Fig. 226) *E. egglestoni* Rolston

- 34(30). Posterior margin of pygophore sinuate in ventral view, mesial concavity moderately broad, shallow to moderately deep (Figs. 85-87) *E. crenator crenator* (F.)
- 34'. Posterior margin of pygophore narrowly or not at all concave mesially in ventral view (Figs. 96-97, 104-105) 35
- 35(34). Posterior margin of pygophore rounded in ventral view, with narrow, shallow, mesial emargination (Fig. 96); or somewhat truncate apically and slightly produced on each side of emargination (Fig. 97) *E. crenator orbiculator*, new subspecies
- 35'. Posterior margin of pygophore broadly truncate from ventral view, usually with narrow, shallow, mesial notch (Figs. 104-105) *E. quadrator*, new species
- 36(30). Posterior margin of pygophore quite sinuate in dorsal view (Fig. 271); short black carina anterolaterad of parameres on lateral walls of genital cup *E. olacitus* Rolston
- 36'. Posterior margin of pygophore rather evenly arcuate in dorsal view (Figs. 263, 277, 283); small, black denticle anterolaterad of parameres of lateral carina 37
- 37(36). Dorsal margin of pygophore with broad, shallow, mesial notch in caudal view (Fig. 281) *E. sulcacitus* Rolston
- 37'. Dorsal margin of pygophore evenly or sinuately concave in caudal view (Figs. 261, 275) 38
- 38(37). Low, broad, mesial protuberance in excavated area behind inferior ridge; posterior margin of pygophore somewhat sinuately concave in caudal view (Fig. 261), slightly trisinate from ventral view (Fig. 262), somewhat thickened *E. corcovacitus* Rolston
- 38'. Area behind inferior ridge smoothly excavated; posterior margin of pygophore somewhat sinuately concave in caudal view (Fig. 275), nearly straight in ventral view (Fig. 276) *E. palacitus* Rolston

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***Euschistus achatadus*, new species** ♀ 1-9

Dorsum sordid yellow to fuscous, becoming nearly black on anterior part of pronotum and head; numerous sordid yellow subcallosous spots and rugae scattered over dorsum, mesial line of same color divides pronotum; punctures dark castaneous to black, unevenly arranged, many in irregular transverse rows, especially on base of pronotum and on scutellum. Ventral surfaces sordid yellow with moderately dense dark castaneous to black punctation. Length without membranes 8.4 mm.

Head as wide as long, 2.0 mm. Lateral margins of juga subparallel for middle third of distance from eyes to apex of head. Tylus and juga equally long, each obtusely rounded at truncate apex of head. Vertex lacking impunctate area mesad of eyes. Antennae sordid yellow, be-

coming brown distally on third segment; longitudinal dark stripe on inner and outer surfaces of basal segment; broad basal ring and apex of last segment pale; length of segments 0.5; 0.7; 0.9; 1.3; 1.5 mm. Bucculae not obviously toothed anteriorly, slightly surpassing apex of basal segment of rostrum.

Pronotum 4.8 mm. wide, 1.9 mm. long at meson. Disk impressed posterior to cicatrices, also between elevated cicatrices and anterior pronotal margin. Anterolateral margins nearly straight, bearing four or five entirely or partially yellowish denticles (Fig. 1). Humeri little produced, broadly rounded, narrowly margined with sordid yellow.

Scutellum slightly narrower at base than long, 2.6 by 2.9 mm., with small black fovea at basal angles; apex punctuate. Membrane of hemelytra dusky, veins not reticulate. Connexiva fuscous, interrupted in middle of each segment by paler marginal spot; punctation dense, coarse, shallow.

Pleural surfaces of thorax bear five black spots on each side, these somewhat obscured by black punctation. Evaporative areas darkly punctate. Mesosterna and metasterna black. Femora ornate with many large to small dark spots. Tibiae marked with a few large dark spots and diffuse maculae.

Large black mesial spot on each abdominal sternite, from base to apex of abdomen each spot larger than preceding one. Spiracles and spot on basal angles of each segment black.

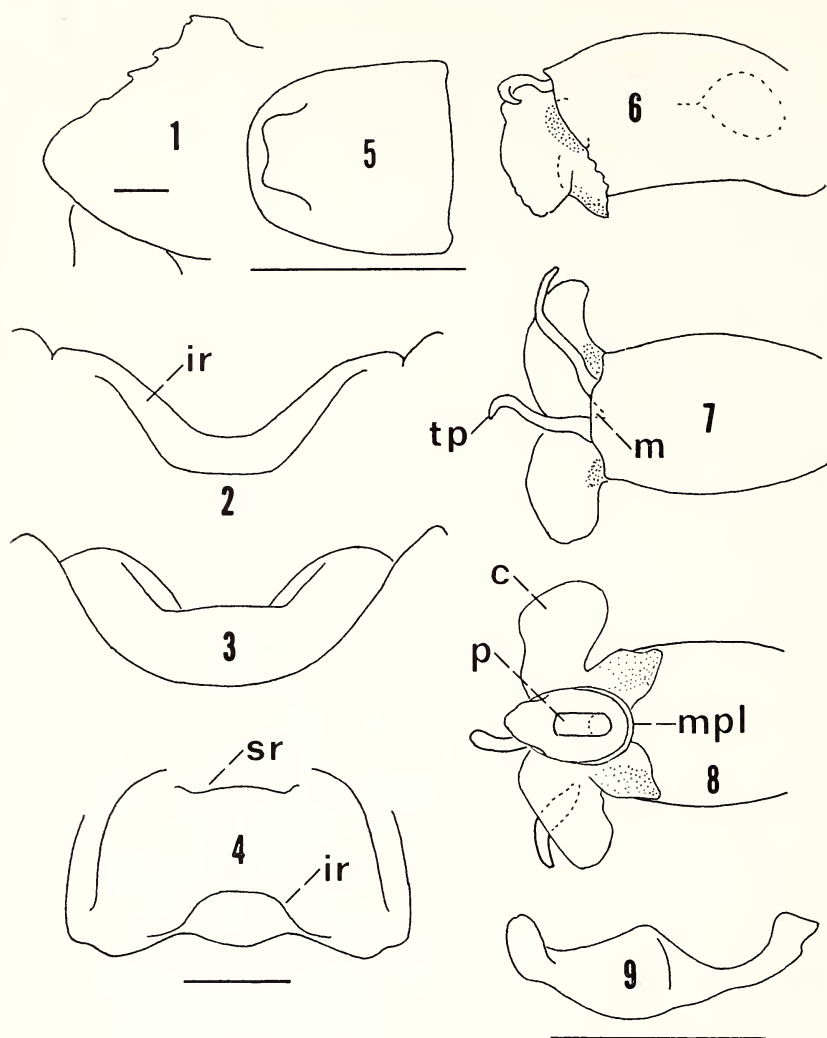
Posterior margin of pygophore with deep, broad, mesially truncate emargination in both caudal and ventral views, approximately paralleled by dorsal margin of inferior ridge in caudal view (Fig. 2); pygophore short in ventral view (Fig. 3); in dorsal aspect, posterior margin of pygophore sinuous, that of inferior ridge deeply concave mesially (Fig. 4). Superior ridge little produced. Preapical tubercles of proctiger fused mesially (Fig. 5). Thecal processes long, slender (Fig. 7); median lobe of theca weakly produced, broad, truncate, unpigmented. Conjunctiva with lateral appendage on each side and one median appendage (Fig. 8); much of lateral appendages heavily sclerotized, mesial appendage entirely hyaline. Short penisfilum lies within trough formed by median penal lobes.

HOLOTYPE: male, labeled (a)¹ Matagalpa K. 138, Nicaragua 26 VII 70 (b) L. H. Rolston, Collector. Type no. 72120, U. S. National Museum.

PARATYPES: none.

DISTRIBUTION: Nicaragua.

¹ Letters in parentheses indicate the number and position of labels with (a) being the topmost label next to the insect.



FIGS. 1-9. *E. achatadus*. Fig. 1. Pronotum. Fig. 2. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 3. Pygophore, ventral aspect. Fig. 4. Genital cup, dorsal aspect, omitting parameres and proctiger; posterior margin of inferior ridge (ir) and superior ridge (sr). Fig. 5. Proctiger. Fig. 6. Theca and related structures, lateral aspect. Fig. 7. Theca and related structures, dorsal aspect; median lobe (m), thecal processes (tp); Fig. 8. Theca and related structures, ventral aspect; conjunctiva (c), median penial lobes (mpl), penisfilum (p). Fig. 9. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

COMMENT: Among the species of this genus in Middle America, *E. achatadus* is unique in lacking an impunctate area at the mesial border of the eyes and in having the tooth near the anterior limits of the bucculae reduced to an obscure lobe. The median row of black spots on the abdominal venter facilitates its recognition.

***Euschistus acutus* Dallas, 1851**

Euschistus acutus Dallas, 1851, p. 202.—Stål, 1872, p. 24.

Dorsum fuscous, grading to black on anterolateral pronotal margins, on humeri, and at least basally on head; numerous yellowish brown subcalloused spots on pronotum, scutellum, base of hemelytra; a lacuna of same color near distal end of radial vein; a small calloused yellow spot on posterior margin of each cicatrice near mesial boundary; punctuation rather dense, black, arranged in irregular transverse rows on base of pronotum. Length without membrane 7.6–9.0 mm.

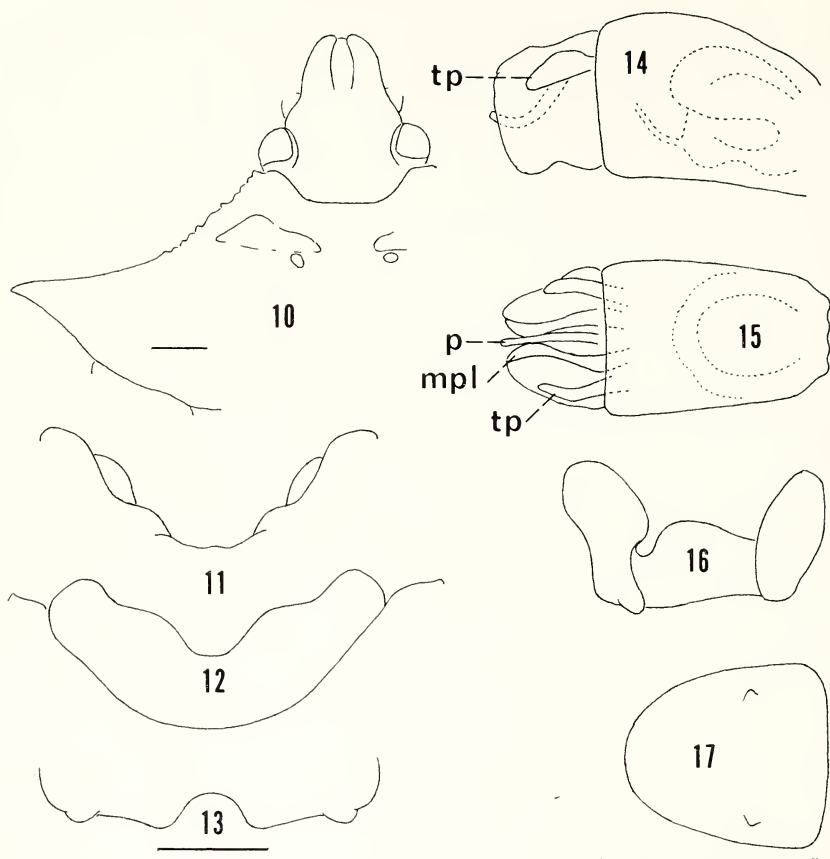
Head slightly longer than or equal to width across eyes, 1.6–1.8 mm. wide. Juga slightly surpassing tylus, inclined near apex from tylus to elevated margin, lateral margins not parallel. Basal segment of antennae brownish yellow with dorsolateral longitudinal streak, narrow incomplete apical ring and elongated ventral spot fuscous; remaining segments fuscous excepting dorsal longitudinal streak on second, basal fifth of third and fourth, and basal half of fifth yellowish; length of segments 0.5–0.6; 0.8–1.0; 0.8–1.0; 1.4–1.6; 1.4–1.7 mm. Bucculae slightly shorter than or equal to length of first rostral segment.

Pronotum 1.9–2.1 mm. long at meson, 3.0–3.2 times as wide at humeri. Anterolateral margin concavely arcuate, denticulate for about one-half distance from apex to humeral angle; denticles black, small, acute or reduced to vertical rugae. Humeral angles strongly produced, acute to spinose, neither elevated nor turned forward (Fig. 10).

Scutellum about one-tenth wider at base than long, 2.7–3.1 mm. long at meson, with small black fovea at basal angles; apex punctate. Membrane of hemelytra darkly translucent, veins simple or furcate. Abdominal tergites nearly concolorous with venter. Connexiva narrowly exposed, black, interrupted in middle and narrowly at apex of each segment with yellow.

Ventral surfaces orange yellow with concolorous punctuation. Pleural surfaces of thorax bear five black spots on each side. Femora and tibiae with many dark spots of nearly uniform size.

Spiracles concolorous with surrounding surface. Narrow black border on lateral margins of abdomen interrupted broadly at middle



FIGS. 10-17. *E. acutus*. Fig. 10. Head and pronotum. Fig. 11. Posterior margin of pygophore, caudal aspect. Fig. 12. Pygophore, ventral aspect. Fig. 13. Posterior margin of pygophore, dorsal aspect. Fig. 14. Theca and related structures, lateral aspect; thecal processes (tp). Fig. 15. Theca and related structures, dorsal aspect; median penal lobes (mpl), penisfilum (p), thecal processes (tp). Fig. 16. Right paramere, lateral aspect. Fig. 17. Proctiger. Dimensional lines equal 0.5 mm.

of each segment, narrowly at obtuse apical angle; each sternite broader at apex than base of following sternite, producing serrate lateral abdominal margins.

Dorsal margin of pygophore with broad, deep, sinuous emargination in caudal view (Fig. 11); pygophore short in ventral view,

emargination broad, sinuous, deep (Fig. 12); posterior margin sinuous in dorsal view with moderately deep, mesial, concave emargination (Fig. 13). Superior ridge not produced posteriorly above proctiger. Theca lacking lobes (Figs. 14, 15); thecal processes widely separated at base, compressed. Penisfilum emerging mesially, lying in trough formed by median penal lobes. Conjunctiva without appendages. Lateral apical surface of parameres large, smooth, flattened (Fig. 16). Dorsolateral tubercles of proctiger nearer base than apex, an elongate mesial impression passing between them (Fig. 17).

TYPE: Female, in British Museum (Natural History), London. Type examined.

DISTRIBUTION: From northern Brazil, Bolivia and Peru northward in South America and Trinidad.

COMMENT: This rather small species is distinguished by the convergent jugal and acute humeral angles that are neither notably elevated nor turned forward. Characteristically the dorsum is very dark with scattered, pale, subcalloused spots and the venter quite pale, often strongly tinted with orange. The contrasting coloration is striking.

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***Euschistus agudus*, new species**

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Dorsum yellowish brown with humeri black; denticles on anterolateral pronotal margin, apex of scutellum pale yellow; punctation uniform, black. Ventral surfaces including punctation and legs, sordid yellow, dull. Length without membranes 9.9–11.3 mm.

Head slightly longer than broad across eyes, 2.0 mm. wide. Jugal a little shorter than tylus; lateral margins very narrowly bordered with black, not parallel. Antennae sordid yellow, immaculate; length of segments 0.6–0.7; 1.0–1.1; 1.5–1.7; 1.6–1.7; 1.5–1.8 mm. Bucculae obtusely toothed anteriorly, evanescent at base of head, subequal in length to basal segment of rostrum.

Pronotum 2.4–2.7 mm. long at meson, 2.8–3.4 times as wide at humeri. Humeral angles acute to spinose, strongly produced, apex elevated well above disk (Figs. 18, 19); denticulate portion of anterolateral margins concavely arcuate, extending about two-thirds distance from apex to humeral angles.

Scutellum as long as wide, 3.5–3.9 mm. wide; small fovea composed of several black punctures in each basal angle; apex impunctate. Membrane of hemelytra slightly brownish; veins sparsely reticulate. Abdominal tergites black. Connexiva black, broadly alternated with yellow at middle of each segment, narrowly so at sutures between segments; punctures moderately large, dense, pale.

Pleural surfaces marked on each side with five small dots. Humeral angles bordered beneath with black. Small dark dots on femora and tibiae most numerous toward apex of femora and base of tibiae. Lateral margins of abdominal sternites dotted with black at basal angles, minutely so at apical angles; spiracles concolorous with sternites.

Concave, moderately deep emargination occupies about one-half breadth of dorsal margin of pygophore in caudal aspect (Fig. 20); outline of pygophore transversely oval in ventral view excepting very shallow broad mesial concavity of posterior margin (Fig. 21); in dorsal view posterior margin evenly rounded (Fig. 22); lateral walls of genital cup each bear small black tubercle anterolaterad of parameres; black carina branching from inferior ridge passes laterad of parameres. Inferior ridge partially outlines keystone shaped impression. Superior ridge moderately produced caudad above proctiger, with mesial emargination narrow, round. Small anterolateral appendage on each side of conjunctiva hyaline; apex of larger posterolateral appendage acute, sclerotized (Fig. 23). Penisfilum lacks apparent sclerotized cap at base. Lateral lobes of theca prominent, extending posteriorly beyond median lobe (Fig. 24). Lateral surfaces of parameres shallowly cupped; apex broadly rounded (Fig. 25). Tubercles on proctiger preapical, not prominent (Fig. 26).

HOLOTYPE: Male, labeled (a) Bogota, Colombia VIII-7-1925, M. H. Nicefero, (b) J. C. Lutz Collection, 1961. Segments IV and V of left antenna, segment V of right antenna missing. Type no. 72121, U. S National Museum.

PARATYPES: 3 ♂♂, 3 ♀♀: COLOMBIA: (a) Bogota (b) Lindig (c) type (d) allotype (e) 19371 (f) Riksmuseum Stockholm, one of four specimens apparently comprising the syntypic series of *Euschistus trisinuatus* Stål, 1872 (♀ NR)¹; same data as holotype (♀ LHR). PANAMA: Hassler Exped. (♂ LHR). VENEZUELA: Maracay, 3/7/33, L. Martorel (♀ USNM) (a) El Pilar (b) H. E. Summers (♂ AMNH). WEST INDIES: (♂ TAMU).

¹ Repositories of paratypes are indicated as follows: American Museum of Natural History (AMNH); British Museum (Natural History) (BMNH); California Academy of Sciences (CAS); Museu Rio-Grandense de Ciências Naturais, Pôrto Alegre (ICN); author's collection (LHR); Louisiana State University (LSU); Museum für Naturkunde an der Humboldt-Universität zu Berlin (MHB); Michigan State University (MSU); Naturhistorisches Museum Wien (NMW); Naturhistoriska Riksmuseum, Stockholm (NR); Ohio State University (OSU); Texas A&M University (TAMU); United States National Museum (USNM); Universitetets Zoologiske Museum, Copenhagen (UZM); Universidad Nacional de la Plata (UNLP).

DISTRIBUTION: Panama, Colombia, Venezuela, and West Indies. The distribution suggests that the West Indian specimen is probably from Trinidad.

COMMENT: This species resembles *E. heros* but differs especially in lacking contrastingly dark intersegmental membranes on the abdominal venter.

***Euschistus atrox* (Westwood), 1837**

Pentatoma atrox [Westwood], 1837, p. 40.

Euschistus atrox: Dallas, 1851, p. 204.

Euschistus trisinuatus Stål, 1872, p. 27. **New Synonymy.**

Yellowish brown above and beneath; punctation uniform, castaneous on dorsum, light castaneous to black on ventral surfaces including evaporative areas, finer and denser on abdomen. Length without membrane 8.8–10.7 mm.

Head slightly longer than width across eyes, 1.9–2.1 mm. wide. Tylus slightly exceeding juga; lateral margins of juga subparallel for middle one-third of distance from eyes to narrowly rounded apex of head. Antennae reddish yellow to deep pink, immaculate; length of segments 0.6–0.7; 0.9–1.1; 1.2–1.6; 1.5–1.9; 1.4–1.7 mm. Bucculae slightly longer than basal segment of rostrum.

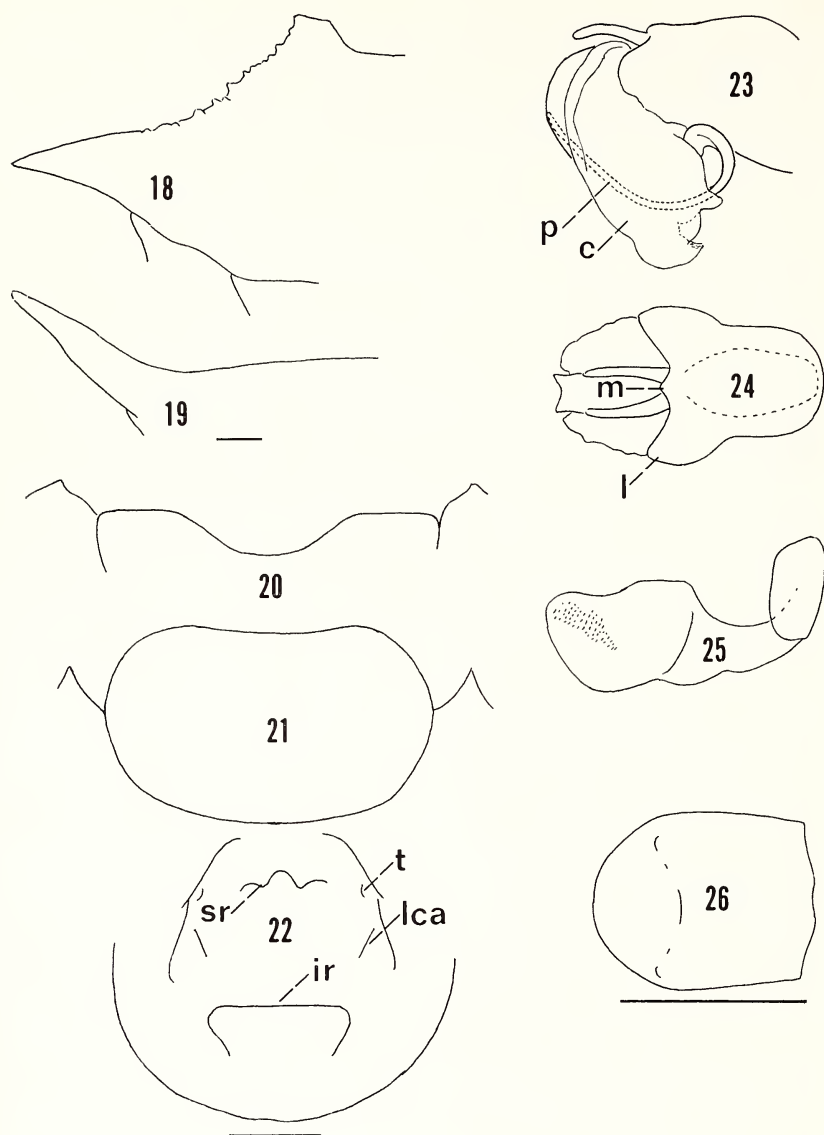
Pronotum 2.2–2.6 mm. long at meson, 2.5–3.0 times as wide at humeri. Anterolateral margins closely denticulate, nearly straight from apex to base of humeri (Fig. 27); denticles concolorous with disk. Humeri acutely produced, usually spinose, black, decidedly elevated and turned cephalad.

Scutellum slightly longer than width at base, 3.1–3.8 mm. wide, with small black fovea in each basal angle; apex punctate. Connexiva narrowly exposed, castaneous, clearly to obscurely relieved by pale spot in middle of each segment, sometimes with narrow black border interrupted at this spot; punctation dense, coarse, pale. Membranes of hemelytra transparent; veins brown, simple or furcate.

Pleural surfaces of thorax marked with five black spots on each side, these sometimes obscure. Legs nearly concolorous with antennae; all of femora and base of tibiae with small darker dots.

Mesial vitta on abdomen poorly defined, incomplete, sometimes much reduced or absent. Outer circumference of spiracular peritremes black, sometimes narrowly so. Black spot at basal angles of abdominal segments.

Posterior margin of pygophore trisinuately emarginate in caudal, ventral and dorsal views (Figs. 28, 29, 30). Tubercles of proctiger preapical, rather prominent. One conjunctival appendage on each



FIGS. 18-26. *E. agudus*. Fig. 18. Pronotum. Fig. 19. Dorsal profile of pronotum, cephalic aspect. Fig. 20. Posterior margin of pygophore, caudal aspect. Fig. 21. Pygophore, ventral aspect. Fig. 22. Genital cup, dorsal aspect, omitting parameres and proctiger; posterior margin of inferior ridge (ir), lateral carina (lca), tubercle (t), posterior

side sclerotized apically, a much smaller hyaline appendage usually discernible ventrad of large appendage. Sclerotized cap present at base of penisfilum (Fig. 32). Median lobe of theca extends farther posteriorly than lateral lobes (Fig. 33). Portion of paramere within genital cup bulbous, knobbed at apex (Fig. 34).

TYPE: Male, in Hope Department of Entomology, University Museum, Oxford. Type examined.

SYNONYMY: Four specimens in the Naturhistoriska Riksmuseum, Stockholm, that presumably comprise the syntypes of *Euschistus trisinuatus* Stål were examined. One of these four specimens, a female, is not conspecific with the other specimens. A lectotype and two paralectotypes are designated from the three remaining specimens.

Euschistus trisinuatus Stål, 1872, lectotype, male, labeled (a) Bogota (b) Lindig (c) ♂ (d) type (e) *trisinuatus* Stål (f) type (g) 19671 (h) Riksmuseum Stockholm; paralectotypes, two females, same data except (c) type (d) paratype and (e) 19371 and 19471.

The type of *Pentatoma atrox* and the lectotype and paralectotypes of *Euschistus trisinuatus* are so alike that Stål evidently had not seen Westwood's specimen, and understandably did not associate his own specimens with the too brief description, at the time he reviewed the genus and described *E. trisinuatus*.

DISTRIBUTION: Guyana (British Guiana), Colombia and Panama.

COMMENT: Most specimens of this species are distinctive because of the contrast between the black, acute or spinose humeri and light, yellowish brown of the remainder of the dorsum including the punctate apex of the scutellum. Specimens with the apex of the scutellum narrowly pale resemble *E. heros*, and those that are darkly discolored bear a likeness to *E. nicaraguensis*.

125 27 ⁶ ***Euschistus bifibulus*** (Palisot de Beauvois), 1805 26 4 35 48

Pentatoma bifibula Palisot de Beauvois, 1805, p. 148, Hem. Pl. 10 fig. 5.

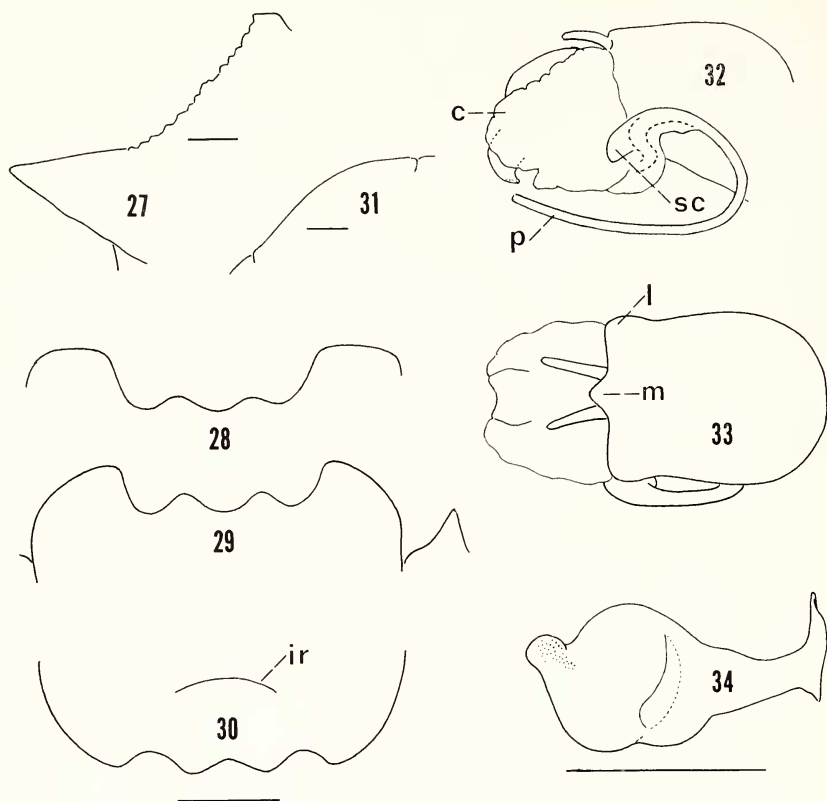
Euschistus pallipes Dallas, 1851, p. 204.

Euschistus bifibula: Dallas, 1851, p. 204.—Stål, 1862, p. 100.

Euschistus bifibulus: Stål, 1872, p. 27.

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margin of superior ridge (sr). Fig. 23. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 24. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 25. Right paramere, lateral aspect. Fig. 26. Proctiger. Dimensional lines equal 0.5 mm.



FIGS. 27-34. *E. atrox*. Fig. 27. Pronotum. Fig. 28. Posterior margin of pygophore, caudal aspect. Fig. 29. Posterior margin of pygophore, ventral aspect. Fig. 30. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 31. Lateral profile of pronotal disk at meson. Fig. 32. Theca and related structures, lateral aspect; conjunctive (c), penisfilum (p), sclerotized cap (sc). Fig. 33. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 34. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

Dorsum yellowish brown to pale castaneous; occasionally with few subcalloused lacunae or clusters of punctures on hemelytra, punctation otherwise uniform, moderately dense, castaneous to black. Ventral surfaces brownish yellow, concolorously punctate. Length of body 7.8-10.1 mm.

Width and length of head subequal, 1.6-2.1 mm. wide across

eyes. Lateral margins tapering, apex rounded, jugs and tylus subequal in length. Antennae brownish yellow to rufous, immaculate or with fine obscure brown dots on three basal segments; length of segments 0.4–0.6; 0.5–0.9; 0.9–1.3; 1.2–1.6; 1.1–1.5 mm. Bucculae equal to or slightly shorter than basal segment of rostrum.

Pronotum 2.0–2.6 mm. long at meson, 2.6–3.1 times as wide at humeri as long. Humeral angles acutely angulate to spinose, usually joined by inconspicuous wavering ruga (Figs. 35–37). Anterolateral margin concave, denticulate nearly to apex of humeri; denticles pale, small, conical, slightly inclined toward humeral angles, widely separated from one another.

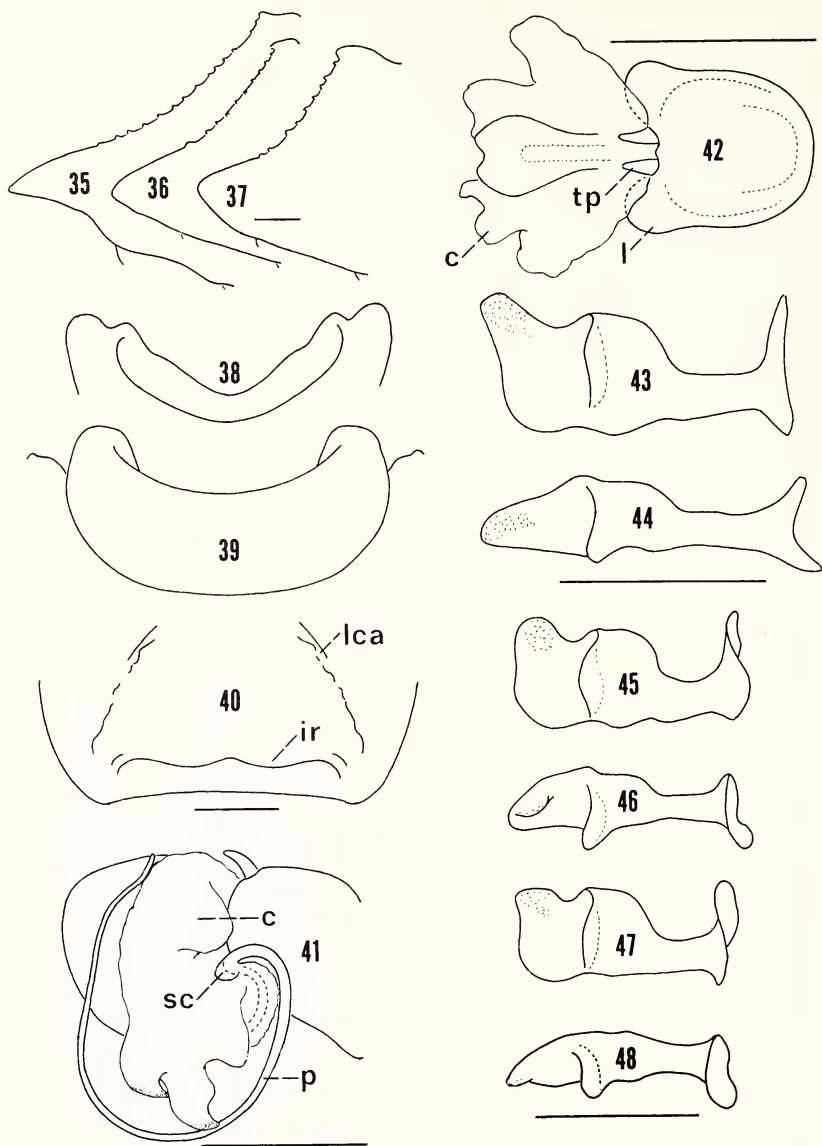
Length and breadth of scutellum subequal, 2.7–3.9 mm. wide at base; fovea at basal angles small or obscure; apex punctate, sometimes pale at very margin; disk usually uneven, rarely transversely rugose. Membrane of hemelytra fumose; veins simple or furcate. Connexiva fuscous along margin, fading mesad to castaneous, broadly interrupted at middle of each segment by brownish yellow spot; punctures pale, dense, somewhat coarse.

Pleural surfaces with five small black spots. Legs yellowish to brown, immaculate. Spiracles concolorous with sternites. Incisures spotted with black at basal angles, sometimes minutely so at apical angles.

Posterior margin of pygophore deeply and broadly concave in both caudal and ventral views (Figs. 38, 39); lateral margins at opening of genital cup bear black subvertical rugae posteriorly, these continuing cephalad on each side as carina on lateral walls (Fig. 40). Inferior ridge entirely visible in caudal view, forming anterior margin of shallow, submarginal sulcus. Superior ridge little produced, entire. Conjunctiva with three appendages on each side; anterior appendage large, hyaline, obtusely rounded apically; posterior appendages small, apex of each acute, sclerotized (Fig. 41). Penisfilum with sclerotized cap at base. Thecal processes very short; lateral lobes of theca produced posteriorly, little expanded laterally (Fig. 42). Basal margin of cupped portion of parameres nearly transverse in both lateral and cephalic aspects, moderately protruding in cephalic view (Figs. 43–48). Tubercles of proctiger preapical, joined by ridge arching anteriorly.

TYPE: Apparently lost. The type of *E. pallipes* Dallas, in the British Museum (Natural History), was seen.

DISTRIBUTION: From northern South America through Middle America to San Luis Potosí, Mexico, and through the West Indies to Cuba.



FIGS. 35-48. *E. bifibulus*. Figs. 35-37. Variation in humeral angles. Fig. 38. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 39. Pygophore, ventral aspect. Fig. 40. Genital cup, dorsal aspect, omitting parameres and proctiger; posterior margin of inferior ridge (ir), lateral carina (lca). Fig. 41. Theca

COMMENT: This species is remarkable for the variability of the parameres, the common form of which is represented in figures 45 and 46. *E. bifibulus* and *E. rugifer* Stål are similar in appearance and in the general form of the pygophore.

p. 711

Euschistus biformis Stål, 1862 ⁸¹ _{50.57}

Euschistus biformis Stål, 1862, p. 100—Stål, 1872, p. 28.—Distant, 1880, p. 60, Pl. 5 fig. 15.

Euschistus capitatus Distant, 1890, p. 331 Pl. 31 fig. 10. **New Synonymy.** *Euschistus biformis nigrita* Kirkaldy, 1909, p. 64 (as variety).

Dorsum pale yellowish brown to castaneous with few to many small calloused or subcalloused spots of same color or paler; punctuation rather uniform, castaneous to black; melanistic form black, base of head and cicatrices castaneous. Ventral surfaces light yellow to flecked or solid red; punctuation usually concolorous, rarely dark on thorax, then not on evaporative areas; melanistic form black, variably relieved with castaneous. Length without membrane 9.9–12.0 mm.

Width of head across eyes and length subequal, 2.1–2.4 mm. wide. Jugal and tylus equally long, or jugal exceeding tylus, leaving apex of head slightly incised; lateral jugal margins tapering from eyes to apex of head or subparallel for middle third of this distance. Basal three segments of antennae thickly dotted with black, entirely black excepting joints in melanistic form; apical two segments light brown to rufous, immaculate; length of segments 0.5–0.6; 0.8–1.1; 0.9–1.2; 1.2–1.5; 1.2–1.5 mm. Bucculae slightly longer than basal segment of rostrum.

Pronotum 2.1–2.5 mm. long at meson, 2.7–2.9 times as wide at humeri. Anterolateral margins closely denticulate about halfway from apex to maximum breadth of pronotum; denticles and disk concolorous, punctures often larger and darker at and on base of denticle than on disk. Humeral angles little produced and broadly rounded to moderately produced, spinose and black at apex (Figs. 49, 50). Disk

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and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 42. Theca and related structures, dorsal aspect; conjunctiva (c), lateral lobes (l), thecal processes (tp). Figs. 43–48. Variation in parameres; right paramere, lateral aspect (odd numbers), cephalic aspect (even numbers). Dimensional lines equal 0.5 mm.

with broad, shallow submarginal impression between each cicatrice and humerus.

Scutellum slightly longer than broad, rarely subequal, 3.5–4.0 mm. wide; small black fovea composed of several coarse punctures at basal angles; apex punctate. Connexiva black or blending mesad to castaneous, with large macula at middle of each segment yellow; punctuation dense, moderately coarse. Membranes of hemelytra fuscous, veins simple or furcate.

Pleural surfaces of thorax with five black spots on each side. Legs brownish yellow, rather thickly strewn with dark spots of various sizes, these often noticeably clustered on anterior face of femora about three-fifths distance from base to apex; legs of melanistic form black, coxae and trochanters castaneous, tarsi brown. Basal angles of abdominal margin translucent and markings of connexiva visible from beneath. Spiracles black.

Dorsal margin of pygophore with broad emargination exposing mesial notch of inferior ridge in caudal view (Fig. 51); posterior margin in ventral view broadly rounded on each side of wide, shallow, sinuous concavity (Fig. 52); in dorsal view, mesial emargination shallow (Fig. 53). Posterior margin of inferior ridge slightly concave, produced posteriorly, overhanging part of excavation between base of ridge and posterior margin of pygophore. Superior ridge produced posteriorly above proctiger, with narrow, rounded, mesial notch. Conjunctiva with two appendages on each side, terminating in acute sclerotized apex (Fig. 54). Base of penisfilum with sclerotized cap. Lateral lobes of theca well developed, far surpassing median lobe posteriorly (Fig. 55). Apex of parameres digitiform, finely shagreened laterally (Fig. 56). Tubercles of proctiger preapical, prominent (Fig. 57).

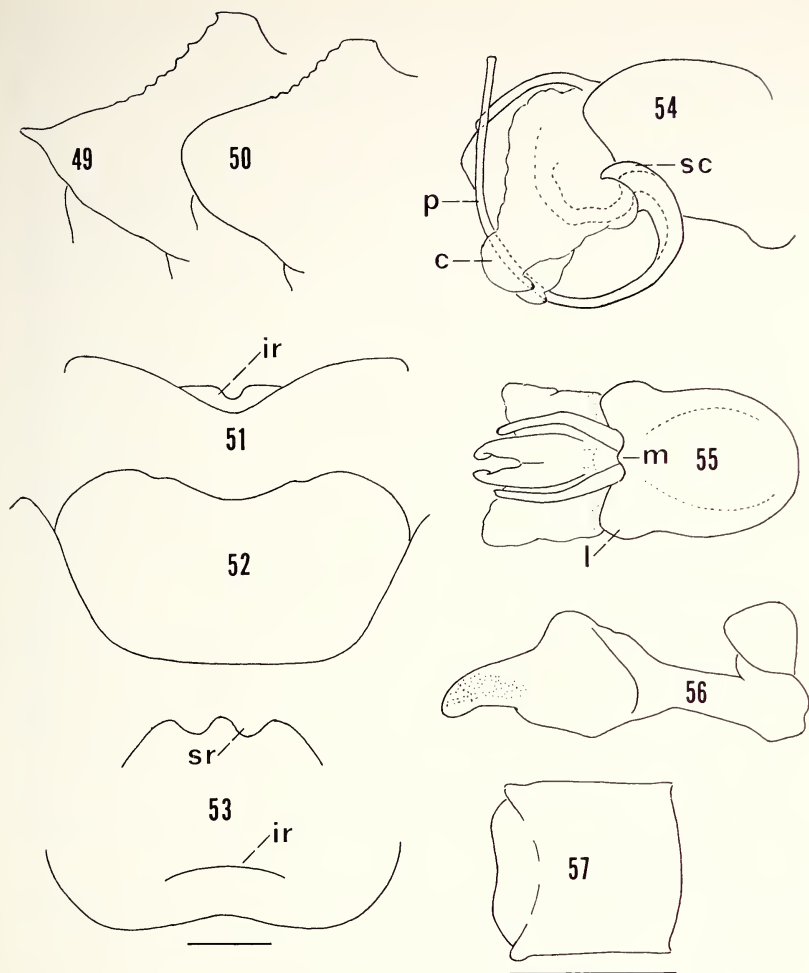
TYPE: Male, in Naturhistorisches Museum, Vienna, Austria. Not seen.

The type of *E. capitatus* Distant, in the British Museum (Natural History), was examined.

SYNONYMY: Distant emphasized that *Euschistus capitatus* is a large pentatomid with the juga clearly surpassing the tylus, and he compared his specimen to *E. servus euschistoides* (Vollenhoven) (= *E. fissilis* Uhler). The type specimen, a female, in the British Museum (Natural History) was examined and is a normal example of *E. bififormis*, although near the upper limits for this species in size and in the degree to which the juga surpass the tylus.

DISTRIBUTION: Panama to southwestern United States.

COMMENT: This abundant species is one of the most variable of



FIGS. 49-57. *E. biformis*. Figs. 49-50. Variation in humeral angles.

Fig. 51. Posterior margin of pygophore, caudal aspect; inferior ridge (ir). Fig. 52. Pygophore, ventral aspect. Fig. 53. Genital cup, dorsal aspect, omitting parameres and proctiger; posterior margin of inferior ridge (ir) and superior ridge (sr). Fig. 54. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 55. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 56. Right paramere, lateral aspect. Fig. 57. Proctiger. Dimensional lines equal 0.5 mm.

the genus in coloration. Inconsistency in the form of the humeral angles undoubtedly suggested the trivial name, but the length of the juga relative to the tylus also varies notably, the three lobes being equally long or the juga plainly surpassing the tylus.

***Euschistus chiapus*, new species** ⁻³²

Dorsum light to dark brown, uniformly and rather densely punctate with castaneous to black; apex of scutellum ivory, impunctate. Ventral surfaces yellowish brown, concolorously punctate. Length without membrane 9.4–11.0 mm. ^{Fig. 58-66}

Head slightly broader across eyes than long, 2.1–2.4 mm. wide, 2.0–2.3 mm. long. Lateral margin of juga subparallel to gently convergent for middle third of distance from eyes to evenly rounded apex of head. Basal three segments of antennae inconsistently marked: basal segment dotted with red or fuscous; fuscous dots, streaks and apical ring appearing singly or in combinations on following two segments; last two segments fuscous excepting yellowish brown ring on basal quarter of each; length of segments 0.6–0.7; 0.9–1.1; 1.3–1.6; 1.6–1.8; 1.6–1.7 mm.; each antenna about one-fifth longer than twice width of head across eyes. Bucculae obtusely lobed anteriorly, evanescent at base of head, a little shorter than basal segment of rostrum.

Pronotum 2.4–2.6 mm. long at meson, 2.5–2.6 times as wide at humeri. Anterolateral margins straight or nearly so; apical third or less rugosely undulating or armed with low, obtusely angular denticles or serrations; narrowly impunctate and pale from apex to near humeri (Figs. 58–59). Humeral angles modestly produced, obtusely rounded.

Scutellum about as broad as long, 3.7–3.9 mm. wide at base; small black fovea at basal angles composed of several punctures; apex pale, impunctate. Connexiva black, middle of each segment occupied by large semicircular pale spot arching mesad from lateral margin; punctation dense, coarse, shallow. Membrane of hemelytra dark, transparent; veins simple or furcate.

Thorax marked on each side with five black spots on pleural surfaces, spot at anterolateral angles of prothorax small, others large; prosternum black between coxae; mesosternum maculated with black before each coxa. Legs a little darker than pleural surfaces; femora with several black spots, tibiae immaculate or with dark dots. Diffuse dark mesial macula on one to four abdominal sternites; lateral margins of abdomen plainly marked with black at both basal and

apical angles of sternites. Spiracles concolorous with surrounding surface.

Posterior margin of pygophore with broad, deep, slightly sinuous emargination (Fig. 60); posterior margin nearly flat mesially, broadly lobed on each side from both ventral and dorsal aspects (Figs. 61, 62); lateral carina on each side of genital cup rugose posteriorly, becoming denticulate anteriorly. Superior ridge produced posteriorly above proctiger, notched mesially. Two small appendages on each side of conjunctiva, both acute, sclerotized at apex (Fig. 63). Penis-filum without apparent cap at base. Lateral lobes of theca well developed (Fig. 64). Tubercles of proctiger preapical (Fig. 66).

HOLOTYPE: Male (a) Ocozocoautla 12 mi. W. Chiapas, Mexico VII-26-52 (b) E. E. Gilbert, C. D. MacNeil, Collectors. Deposited in American Museum of Natural History.

PARATYPES: 3 ♂♂, 1 ♀. GUATEMALA: Chiquimula, Chiq., 1000 ft. VII-21-1947 (♂ LHR). MEXICO: same data as holotype (♀ AMNH; ♂ USNM); Oaxaca, 32.8 mi. NW Jalapa del Marques. July 13, 1972, Clark, Murray, Hart, Schaffner (♂ TAMU).

DISTRIBUTION: Guatemala and the Mexican state of Chiapas.

COMMENT: This species resembles *E. bififormis* in size and general appearance but is at once separated by the pale, basal rings of the last two segments of the antennae, the pale impunctuate apex of the scutellum, and feeble denticulation of the anterolateral pronotal margins.

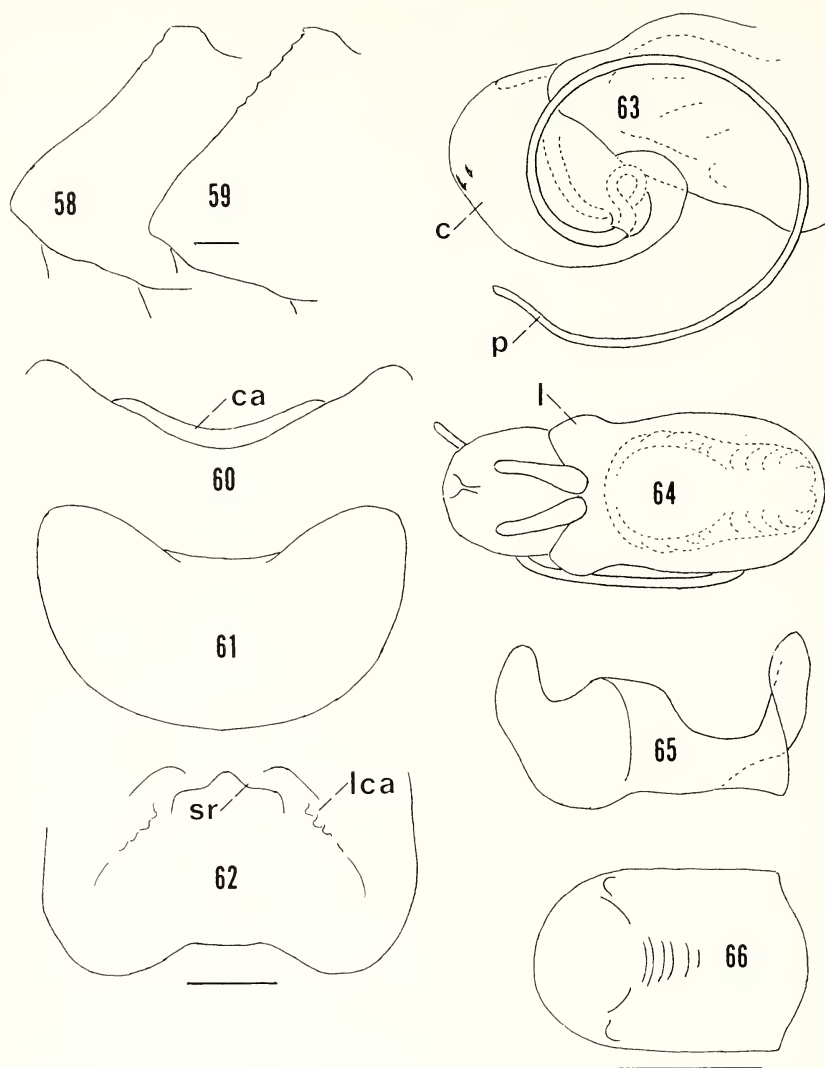
***Euschistus comptus* Walker, 1868**

Euschistus comptus Walker, 1868, p. 550.—Stål, 1872, p. 28.—Distant, 1880, p. 60, Pl. 6 fig. 11.

Yellowish brown, punctured with black above and beneath. Length without membranes 10.5–11.4 mm.

Width of head across eyes and length subequal, 2.2–2.3 mm. wide. Lateral margins of juga tapering from eyes to broadly rounded apex; tylus depressed toward apex, margins here overlapped by juga; base of tylus and vertex behind tylus sparsely punctate. Basal segment of antennae dotted with fuscous, remaining segments rufous, immaculate; length of segments 0.6; 0.8–0.9; 1.1–1.2; 1.2; 1.2–1.4 mm. Bucculae subequal in length to basal segment of rostrum.

Pronotum 2.8–3.1 mm. long at meson, 2.4–2.6 times as wide at humeri as long; anterolateral margins shallowly concave from apex to humeral angles, closely denticulate for about three-fourths distance from apex (Fig. 67); humeral angles little produced, acutely angular,



FIGS. 58-66. *E. chiapus*. Figs. 58-59. Variation in denticulation of anterolateral margin of pronotum. Fig. 60. Posterior margin of pygophore, caudal aspect; carina (ca). Fig. 61. Pygophore, ventral aspect. Fig. 62. Genital cup, dorsal aspect, omitting parameres and proctiger; lateral carina (lca), superior ridge (sr). Fig. 63. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 64. Theca and related structures, dorsal aspect; lateral lobes (l). Fig. 65. Right paramere, lateral aspect. Fig. 66. Proctiger. Dimensional lines equal 0.5 mm.

joined by conspicuous impunctate fascia, densely punctate behind fascia.

Scutellum as long as broad 3.8–4.4 mm. at base; disk unevenly punctate, fovea at basal angles obscure; apex punctate. Membrane of hemelytra hyaline, usually with some small dark inconspicuous spots; venation simple, fuscous. Connexiva weakly alternated, black along margin, fading mesad to castaneous; pale subcircular spot centered in each segment; punctation dense, coarse, shallow, pale.

Evaporative areas punctured with black. Femora thickly dotted with black; tibiae immaculate or nearly so. Spiracles and lateral margins of abdomen pale yellow, latter calloused, immaculate at incisures; apical borders of some or all sternites often adorned with bright impunctate irregularly shaped lacunae.

Posterior margin of pygophore broadly and deeply emarginated; bottom of emargination rounded in caudal view, exposing inferior ridge (Fig. 68), imperfectly rounded in ventral view, partially exposing inferior ridge (Fig. 69), flat in dorsal view (Fig. 70). Inferior ridge and bottom of emargination separated by narrow sulcus. Superior ridge little produced posteriorly above proctiger, roundly notched at meson. Two appendages on each side of conjunctiva, both partially sclerotized, acute apically (Fig. 71). Penisfilum emerges mesially, with small sclerotized cap at base. Lateral lobes of theca well developed (Fig. 72). Parameres terminate in simple hook (Fig. 73). Tubercles of proctiger subapical.

TYPE: Male, in British Museum (Natural History), London. Type examined.

DISTRIBUTION: Guatemala northward to Nayarit, Mexico.

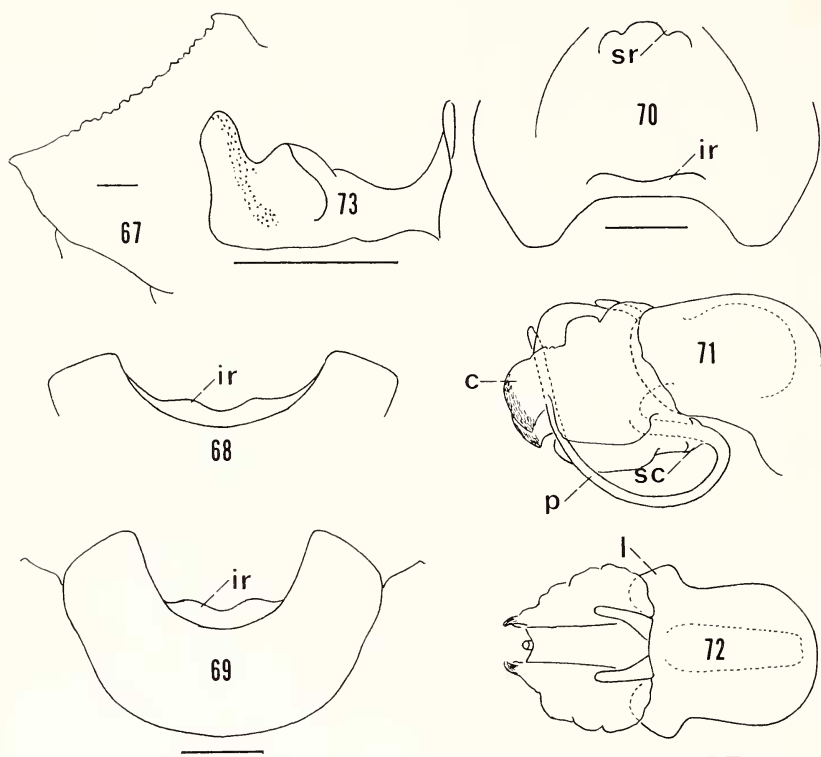
COMMENT: The subcalloused form of the lateral margins of the abdomen separate this species from *E. comptus*, which it closely resembles.

***Euschistus crassus* Dallas, 1851**

Euschistus crassus Dallas, 1851, p. 205.—Barber, 1914, p. 522.—Blatchley, 1926, p. 141.

Sordid white to yellow brown, rather sparsely and unevenly punctate above and beneath with rufous to black, overall effect gray to light tan. Length without membrane 9.7–12.2 mm.

Width of head through eyes subequal to length, 2.1–2.5 mm. wide. Jugal nearly as long as tylus, lateral margins subparallel for middle third of distance from eyes to apex of head. Antennae sordid white to rufous, basal segment finely dotted, remaining segments im-



FIGS. 67-73. *E. comptus*. Fig. 67. Pronotum. Fig. 68. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 69. Pygophore, ventral aspect; inferior ridge (ir). Fig. 70. Genital cup, dorsal aspect, omitting parameres and proctiger; inferior ridge (ir), superior ridge (sr). Fig. 71. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 72. Theca and related structures, dorsal aspect; lateral lobes (l). Fig. 73. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

maculate, last two often a little darker; length of segments 0.6-0.7; 0.9-1.2; 1.2-1.6; 1.3-1.5; 1.2-1.6 mm. Bucculae as long as or slightly shorter than basal segment of rostrum.

Pronotum 2.5-3.3 mm. long at meson, 2.3-2.5 times as wide at humeri; anterolateral margins unevenly and shallowly concave from above, rounded, vertically rugose and denticulate; denticles few, angular, discrete, or numerous with some irregular or confluent (Figs.

73, 74); humeral angles modestly produced, usually acutely toothed, rarely obtusely rounded; humeri joined by narrow impunctate caloused fascia.

Scutellum as long as broad, 3.6–4.7 mm. wide at base; basal angles lacking fovea; apex broadly rounded, punctate along meson, usually impunctate and often paler on each side. Membrane of hemelytra vitreous to milky with numerous small brown dots; veins concolorous with spots, simple or furcate. Connexiva narrowly exposed, fuscous, alternated with pale spot at middle and at base of each segment; punctures dense, coarse, pale.

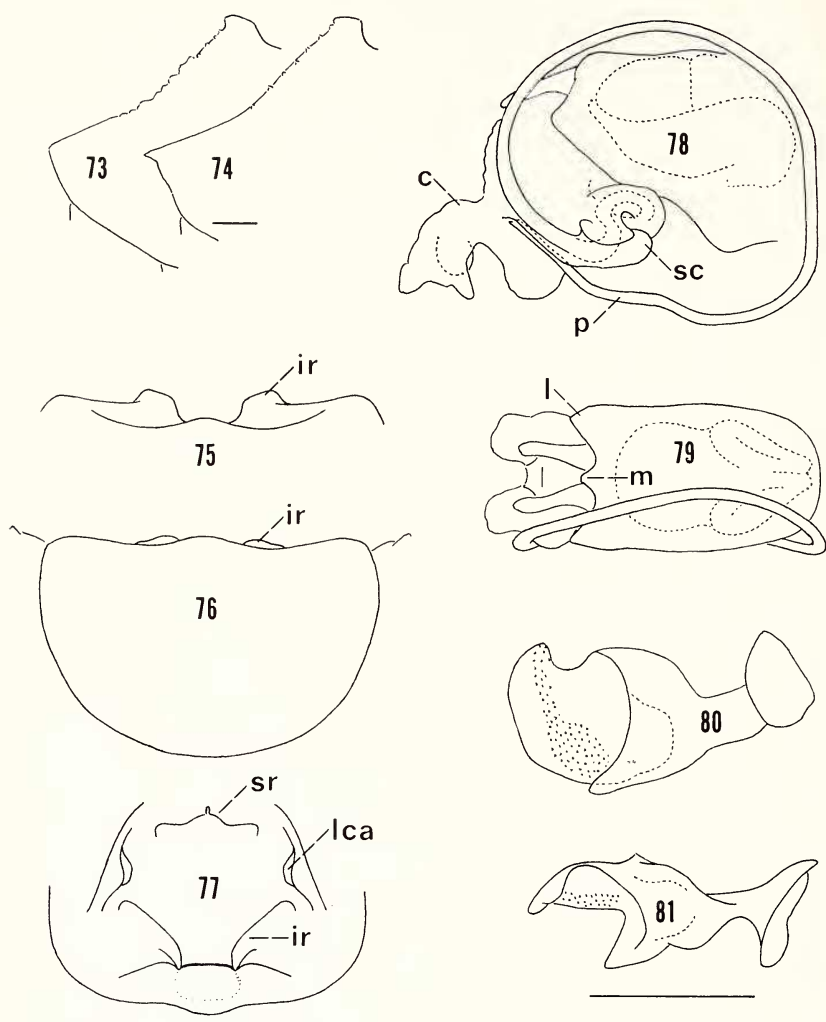
Evaporative areas punctate with black. Dots on femora and tibiae dense, fine. Abdominal venter finely punctate, sparsely so mesially, most coarsely as vitta mesad of spiracular line on each side; dark punctures sometimes confined to vittae. Spiracles concolorous with supporting sclerites. Apical angles of abdominal sternites somewhat produced, obtuse; incisures along lateral margins immaculate or spotted with black.

Posterior margin of pygophore concavely depressed on each side of mesial convexity in both caudal and ventral views; ventral surface of pygophore nearly semicircular; in dorsal view, posterior margin of pygophore and inferior ridge separated by transversely oval mesial pit. Thin black lateral carina traverses lateral walls diagonally, directed dorsad and cephalad from depth of genital cup, at anterior limit of tumescence on lateral walls. Inferior ridge largely exposed in caudal view, almost hidden in ventral view (Figs. 75, 76), triangularly tumid on each side, with acutely toothed mesial angle elevated above and projecting over mesial pit (Fig. 77). Superior ridge slotted along meson at base of concave emargination. Apical margin of parameres flattened in lateral view (Fig. 80), deeply incised and cupped in cephalic view (Fig. 81). Proctiger abruptly deflected subapically, without tubercles. Appendage of conjunctiva trifurcate (Fig. 78). Penisfilum with sclerotized cap at base. Theca elongate, lobes well developed; lateral lobes surpassing median lobe, not laterally expanded (Fig. 79).

TYPE: Male, in British Museum (Natural History), London.

DISTRIBUTION: Coastal plains of southern United States, Cuba, Hispaniola, and possibly into Mexico.

COMMENT: West Indian specimens of this species are smaller, 7.6–8.0 mm. in length, than those from west of the Mississippi River and differ subtly in the structure of the parameres and genital cup. Intermediate forms occur commonly in southeastern United States.



FIGS. 73-81. *E. crassus*. Figs. 73-74. Variation in humeral angle and denticulation. Fig. 75. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 76. Pygophore, ventral aspect, inferior ridge (ir). Fig. 77. Genital cup, dorsal aspect, omitting parameres and proctiger; inferior ridge (ir), lateral carina (lca), superior ridge (sr). Fig. 78. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 79. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 80. Right paramere, lateral aspect. Fig. 81. Right paramere, cephalic aspect. Dimensional lines equal 0.5 mm.

CRENATOR GROUP

The species and subspecies of the crenator group (*Euschistus crenator crenator*, *E. crenator orbiculator*, and *E. quadrator*) are clearly united by the structure of the male genitalia and other characters. Middle American congeners most similar in size and appearance are *E. emorei*, *E. vetus* and the four species of the *sulcatus* group. The male genitalia permit unequivocal separation of all these species and placement of most specimens of *E. crenator* into one or the other of the two subspecies. The females, however, form a complex that is only partially resolved at present.

GROUP CHARACTERISTICS

Length of males 8.4–10.8 mm., width at humeri 5.2–7.0 mm. Dorsum light brown, rarely suffused with red, often black at humeri and along anterolateral margin of pronotum; punctation somewhat uneven, usually leaving several small lacunae on hemelytra, often on scutellum, occasionally on pronotum, and frequently suggesting transverse impunctate fascia between humeri; without calloused spots or conspicuous clustering of punctures; punctures castaneous to black, nearly always black and crowded along anterolateral pronotal margins, at least toward apex. Ventral surfaces pale brownish yellow, sometimes flecked with red; punctures concolorous with surface.

Length of head and width through eyes subequal, 1.9–2.1 mm. wide. Lateral jugal margins sigmoid from eyes to rounded apex of head, subparallel or narrowing slightly toward apex for middle third of this distance. Tylus subequal to juga in length. Antennae as dark as dorsal surface of head to as pale as ventral surface; last two segments, excepting base of each, darkest; basal segment nearly attaining apex of head, sometimes sparsely ornated with dark dots; length of segments 0.5–0.6; 0.8–1.2; 1.0–1.5; 1.2–1.7; 1.3–1.7 mm. Bucculae obtusely toothed anteriorly, more or less percurrent caudad of tooth, evanescent at base of head. First rostral segment subequal to bucculae in length.

Pronotum 2.0–2.6 mm. long at meson, width at humeri 2.4–3.0 times length. Anterolateral margins closely denticulate for about two-thirds distance from apical to humeral angles, concave along denticulate portion; denticles light brownish yellow to black; punctures usually darkest and most crowded along denticulate margin nearest apex of pronotum, a few punctures encroaching among and onto base of denticles. Humeri moderately produced, obtusely rounded to spinose,

usually entirely black and elevated when acutely angular or spinose (Figs. 82, 83). Pronotal disk conspicuously impressed only on apical submargin; cicatrices little elevated.

Breadth and length of scutellum subequal, 3.0–3.8 mm. long; margin of apex often narrowly pale with few or no punctures. Membrane of hemelytra nearly colorless, darker venation simple to sparingly reticulate. Punctures on connexiva coarse, thick, shallow, pale; margin black to castaneous, broadly interrupted in middle of each segment with pale yellow.

Thorax with five black spots on each side. Evaporative areas matte, nearly concolorous with adjacent surfaces. Femora and tibiae dappled with dark spots of various sizes, often and obscurely so in *E. crenator*. Spiracles concolorous with supporting sclerites. Anterolateral angles of each segment embrace small black dot; posterolateral angles usually black at very apex.

Pygophore slightly concave in lateral profile; viewed dorsally, inferior ridge defines anterior and lateral margins of transverse oval or reniform impression, this impression indistinctly separated posteriorly from excavated area continuing to posterior margin of genital cup (Figs. 88, 98, 106); small black tubercle situated anterolaterad of parameres on lateral walls. Superior ridge produced posteriorly, notched mesially (Fig. 89). Small dorsolateral preapical tubercle on each side of proctiger (Fig. 93). Conjunctiva bears two small appendages on each side; posterolateral appendage heavily sclerotized apically; anterolateral appendage seldom pigmented, then only lightly at apex (Figs. 91, 101, 110). Base of penisfilum without conspicuous sclerotized cap. Lateral lobes of theca expanded both laterally and posteriorly, giving theca shape of bell in dorsal aspect; median lobe small but obvious.

24, 37 **Euschistus crenator crenator** (Fabricius), 1794

39 *Cimex crenator* Fabricius, 1794, p. 101.

39 52 *Pentatoma obscura* Palisot de Beauvois, 1805, p. 149, Hem. Pl. 10 fig. 7 (♂).

49 *Pentatoma pustulata* Palisot de Beauvois, 1805, p. 185, Hem. Pl. 11 fig. 2.

Pentatoma crocipes [Westwood], 1837, p. 40. **New Synonymy.**

49 *Euschistus obscurus* Dallas, 1851, p. 208.

49 *Euschistus proximus* Dallas, 1851, p. 208. **New Synonymy.**

36 *Euschistus reductus* Walker, 1867, p. 246. **New Synonymy.**

Euschistus conterminus Walker, 1867, p. 248.

70 *Mormidea melanocantha* Walker, 1868, p. 552.

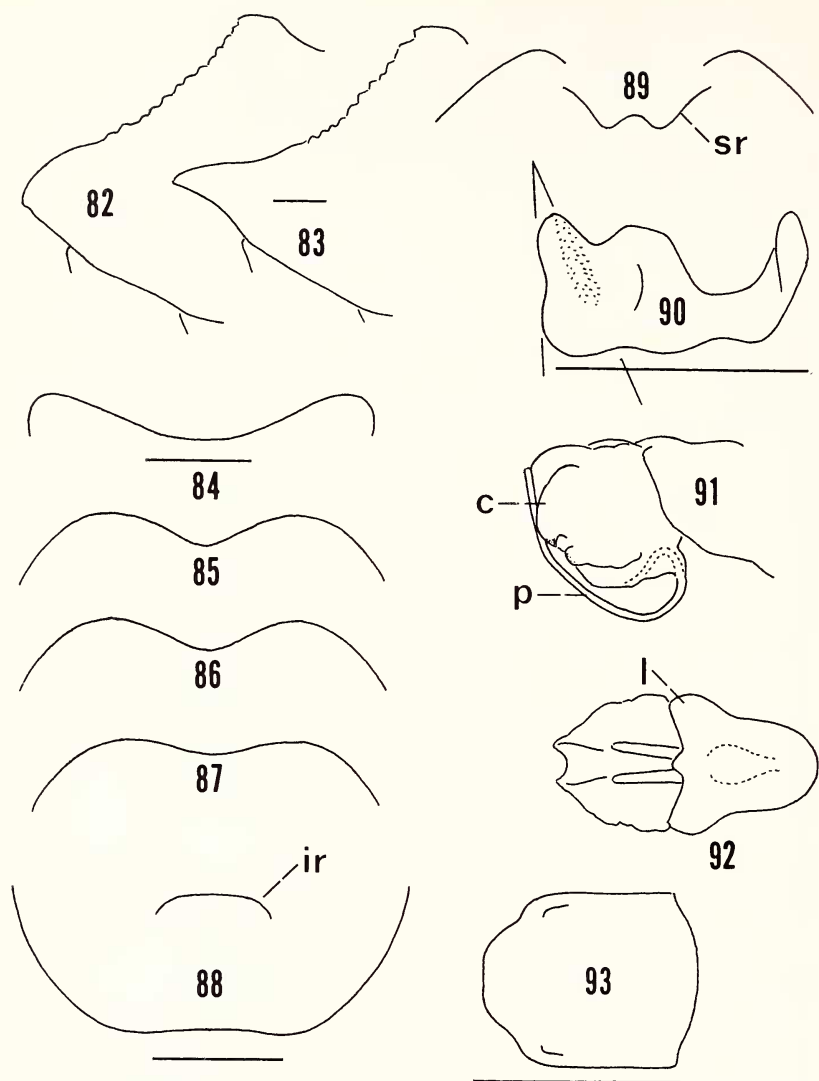
Euschistus crenator: Stål, 1868, p. 26 (redescription of type).—Stål, 1872, p. 27 (in part).

Posterior margin of pygophore with broad, mesial concavity in caudal view (Fig. 84), sinuate in ventral view with mesial concavity moderately broad, shallow to moderately deep (Figs. 85-87), rounded in dorsal view but broadly shallowly concave at apex (Fig. 88). Shagreened surface of parameres elongate, extending about three-fourths distance across parameres, its longitudinal axis diverging about 20° from line along apical margin of parameres (Fig. 90).

TYPE: Male, from St. Thomas Island, Virgin Islands, West Indies. In Universitetets Zoologiske Museum, Copenhagen, Denmark.

SYNONYMY: The variability of this species in color, punctuation, size, and to a lesser degree in the form of the pygophore, no doubt accounts for the large number of junior synonyms attributable to it. The holotype of *Cimex crenator* Fabricius was loaned by the Universitetets Zoologiske Museum, Copenhagen, for examination and dissection, and the British Museum (Natural History) made available the holotypes, all males, of *Euschistus obscurus* Dallas, *E. proximus* Dallas, and *E. reductus* Walker. Differences among these four types consist of trivial variations in color, punctuation, size, venation, acuteness of the humeral angles and depth to which the posterior margin of the pygophore is emarginate. All variations from the type of *Cimex crenator* are well within the range observed for this species. The holotypes, both males, of *Pentatoma crocipes* [Westwood], in the Hope Department of Entomology, Oxford, and *Euschistus conterminus* Walker in the British Museum (Natural History) were examined by Drs. I. Lansbury and W. R. Dolling, respectively, and judged by them not to differ significantly from the material sent to them for comparison. The holotype of *Mormidea melanocantha* Walker, also in the British Museum (Natural History), is a female from Hispaniola (St. Domingo). The status of this name as a junior synonym is presumed from the type locality to be correct. Palisot de Beauvois' specimens, also from Hispaniola, cannot be located in the Museum National d'Histoire Naturelle in Paris and presumably are lost. I have followed Stål (1868) in citing *Pentatoma obscura* (δ) and *P. pustulata* as junior synonyms.

DISTRIBUTION: From Peru and Brazil (Bahia) through the West Indies. Forms intermediate between the nominate subspecies and *E. crenator orbiculator* occur in Colombia and Ecuador. One male from the Canal Zone, Panama, and two from British Honduras having the characters of the nominate subspecies were examined. The latter specimens are probably mislabeled or adventitious.



FIGS. 82-93. *E. crenator crenator*. Figs. 82-83. Variation in humeral angles. Fig. 84. Posterior margin of pygophore, caudal aspect. Figs. 85-87. Variation in posterior margin of pygophore, ventral aspect. Fig. 88. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 89. Superior ridge (sr). Fig. 90. Right paramere, lateral aspect. Fig. 91. Theca and related structures; conjunctiva (c), penisfilum (p). Fig. 92. Theca and related structures, dorsal aspect. Fig. 93. Proctiger. Dimensional lines equal 0.5 mm.

Euschistus crenator orbiculator, new subspecies

Posterior margin of pygophore with two intergrading forms. Commonly, broadly concave in caudal view (Fig. 94), rounded with narrow, shallow, mesial concavity in both ventral and dorsal views (Figs. 96, 98). Infrequently, shallowly concave and sinuous mesially in caudal view (Fig. 95), with moderately broad, very shallow, mesial concavity in both ventral and dorsal views (Figs. 97, 99). Longitudinal axis of elongate, shagreened surface of parameres inclined about 35° from line along apical margin (Fig. 100).

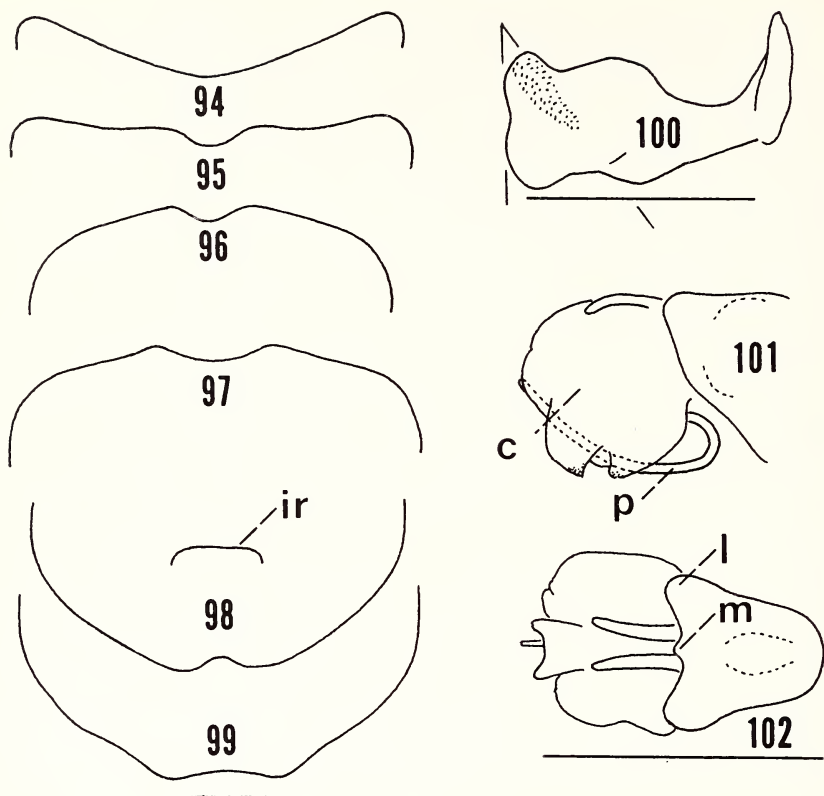
HOLOTYPE: male, labeled Las Nubes, Managua, Nicaragua 1-V-69. Weeds, Ev. Vogel, Coll. Type no. 72124, U. S. National Museum.

PARATYPES: 33 ♂♂. **COSTA RICA:** Piedra Blanca Bay, 11-6-38 (LSU). *El Salvador:* Quezaltepeque, 500 m. VI-19-63. (b) D. Q. Cavagnaro & M. E. Irwin (CAS). **GUATEMALA:** Zacapa, Zac., 600 ft. VII-19-1947. (b) C. & P. Vaurie (LSU); San Jose, VIII-20-1954. E. S. Ross (CAS). **HONDURAS:** Punta Castilla, J. Beard. IX/2 (AMNH). **MEXICO:** *Chiapas:* 31 mi. SE Comitán, VI-18-65. At light. Burke, Meyer, Schaffner (TAMU). *Colima:* Manzanillo, VII-18-1953 (b) C. & P. Vaurie (2 AMNH). *Nayarit:* 3 mi SE San Blas, VII-25-66. P. M. & P. K. Wagner (ICN). *San Luis Potosí:* El Salto, VI-5-1965. Burke, Meyer, Schaffner (BMNH). *Sinaloa:* Mazatlan, March 5, 1918. J. A. Kusche (2 CAS). *Tamaulipas:* 8 mi. W. El Limón, July 20, 1970. At light. Murray, Phelps, Hart, Schaffner (TAMU); 5 mi. SSE Gómez Farias, July 19-20, 1970. Murray, Phelps, Hart, Schaffner (2 TAMU). *Vera Cruz:* Papantla, 900 ft. Aug. 1, 1955. P. & C. Vaurie (AMNH); Llera, 7-20-54, R. R. Dreisbach (MSU); Vera Cruz, VIII/1-6/61. R. & K. Dreisbach (MSU). *Yucatan:* Valladolid, IX-13-1952. J. & D. Pallister (LHR); Chichén Itzá, IX-14-1952. J. & D. Pallister (AMNH); same data except date, 7-19-1952 (AMNH). **NICARAGUA:** same data as holotype (BMNH, LHR, NMW, 2 NR, OSU, 2 USNM, 2 UZM). **PANAMA:** Barro Colorado, C. Z., III-22-1933. H. F. Schwarz (AMNH); Ft. Clayton, C. Z., XI-12-44. K. E. Frick (LHR).

DISTRIBUTION: From Ecuador and Colombia to the northern border of Mexico.

Euschistus quadrator, new species

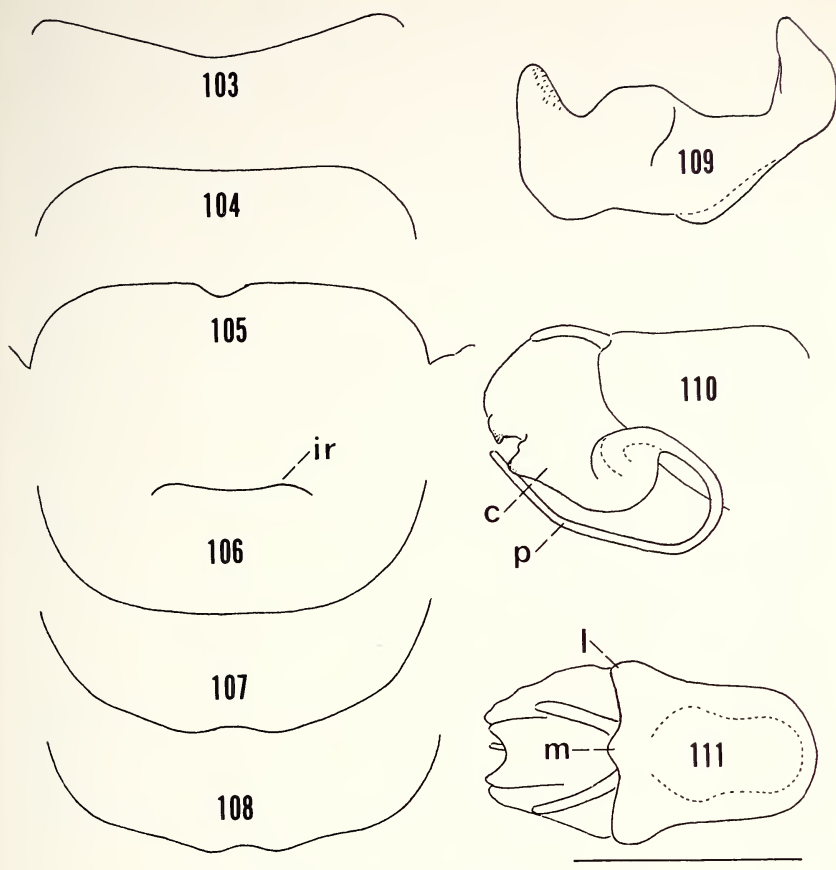
Posterior margin of pygophore broadly V shaped or concave in caudal view (Fig. 103), broadly truncate in ventral view (Fig. 104), usually with small, mesial notch (Fig. 105), rounded in dorsal view (Fig. 106), usually with shallow, narrow, mesial concavity (Fig.



FIGS. 94-102. *E. crenator orbicularis*. Figs. 94-95. Variation in posterior margin of pygophore, caudal aspect. Figs. 96-97. Variation in posterior margin of pygophore, ventral aspect. Figs. 98-99. Variation in posterior margin of pygophore, posterior margin of inferior ridge (ir), dorsal aspect. Fig. 100. Right paramere, lateral aspect. Fig. 101. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 102. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Dimensional lines equal 0.5 mm.

107), sometimes flattened on each side of this concavity (Fig. 108). Shagreened area of paramere short, extending little if any beyond base of notch in cephalic margin (Fig. 109).

HOLOTYPE: Male, labeled 10 mi. SE Monterrey, N. L., Mexico. 3000 ft. Night beating. VII-5-59. R. B. Selander & J. C. Schaffner. Type no. 72125, U. S. National Museum.



FIGS. 103-111. *E. quadrator*. Fig. 103. Posterior margin of pygophore, caudal aspect. Figs. 104-105. Variation in posterior margin of pygophore, ventral aspect. Figs. 106-108. Variation in posterior margin of pygophore, inferior ridge (ir), dorsal aspect. Fig. 109. Right paramere, lateral aspect. Fig. 110. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 111. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Dimensional lines equal 0.5 mm.

PARATYPES: 33 ♂♂. MEXICO: *Nuevo Leon*: same data as holotype (LHR); Pesqueria, VII-7-59. R. B. Selander & J. C. Schaffner (USNM). *San Luis Potosí*: 17 mi. N. Ciudad Valles, July 7, 1966. P. M. & P. K. Wagner (UZM). *Tamaulipas*: Victoria, V-22-1952 (b)

M. Cazier, W. Gertsch, R. Schrammel (2 AMNH); 5 mi. SSE Gomez Farias, July 19, 1970. At light. Schaffner, Hart, Murray, Phelps (TAMU). Vera Cruz: Tebanca, Lake Catemaco, VI-8-65 (LSU); Tuxpan, VI-6-65. At light. Burke, Meyer, Schaffner (NR). Yucatan: Cordeleria, Mayapan, Aug. 9, 1952. J. & D. Pallister (3 AMNH); same data except dates 7-27-1952, 8-3-1952, IX-8-1952, IX-8-1952 (4 AMNH); Merida, VI-27-1952. J. & D. Pallister (AMNH, BMNH, LHR, NR, UZM). U.S.A., Louisiana: Avoyelles Parish. 18-VII-1969 (LHR): Texas, Cameron Co.: Brownsville, VI-23-25-50. G. Linsley (2 CAS); 5 mi. W. Brownsville, June 22, 1969. Board & Hafernik, (LSU, USNM); same data except dates, June 14, 1969 (MSU) and June 15, 1969 (OSU). Hidalgo Co.: Bentsen Rio Grande State Park, June 18, 1969. Board & Hafernik (ICN, TAMU). San Patricio Co.: Welder Wildlife Ref., June 22, 1969. Board & Hafernik (NMW); Lake Corpus Christi State Park, June 9, 1969. Board & Hafernik (TAMU).

DISTRIBUTION: Apparently this species is confined to the coastal plains and bordering foothills from Yucatan, Mexico, into Louisiana, USA.

Euschistus emooresi Rolston, 1972

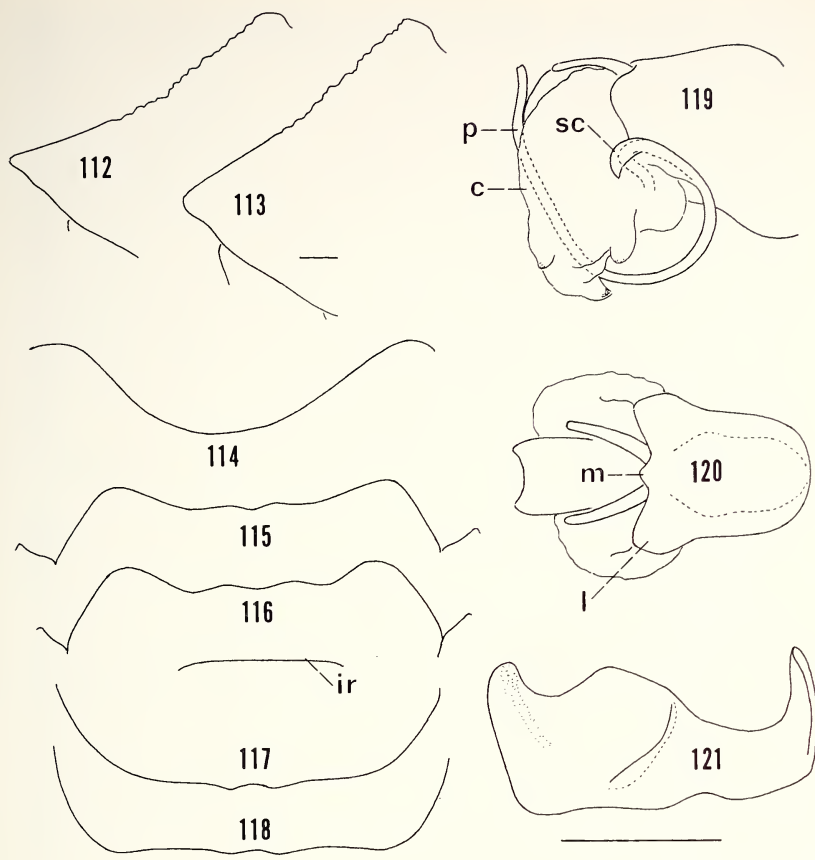
Euschistus emooresi Rolston, 1972, p. 183.

Medium size, length 10.0–11.6 mm. width at humeral angles 6.2–6.9 mm. General color of dorsum light brown, ventral surfaces paler yellowish-brown. Punctuation on dorsum castaneous, moderately close, exceptionally uniform; usually a few small lacunae especially on hemelytra, but no calloused spots or clusters of punctures; punctuation beneath concolorous with ventral surfaces.

Basal three segments of antennae concolorous with ground color of head, apical two segments slightly darker, a few small dark dots scattered on first segment; bucculae evanescent at base of head, as long as or slightly shorter than first rostral segment.

Anterolateral margins of pronotum nearly straight, apical two-thirds serrate; humeral angles little produced, angular or narrowly rounded, rarely spinose (Figs. 112, 113); disk anterior to humeri moderately declivent, nearly flat. Apex of scutellum punctate, very margin often ivory, otherwise concolorous with disk; membrane of hemelytra hyaline, unspotted; veins simple or furcate, fumose. Connexiva narrowly exposed, darkly colored on either side of sutures.

Pleural surfaces with five black spots on each side. Evaporative area concolorous. Spiracles concolorous with surrounding surface.



FIGS. 112-121. *E. emoorei*. Figs. 112-113. Variation in pronotal angles. Fig. 114. Posterior margin of pygophore, caudal aspect. Figs. 115-116. Variation in posterior margin of pygophore, ventral aspect. Figs. 117-118. Variation in posterior margin of pygophore, dorsal aspect; posterior margin of inferior ridge (ir). Fig. 119. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 120. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 121. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

Abdominal sternites spotted with black at anterolateral angle, usually minutely marked with black at posterolateral angle.

Posterior margin of pygophore evenly, concavely and rather deeply arcuate in caudal view (Fig. 114); broadly, shallowly, sinu-

ously emarginated in ventral view, emargination sometimes nearly quadrate (Figs. 115, 116); broadly rounded to truncate in dorsal view, slightly sinuous mesially (Figs. 117, 118); posterior margin of inferior ridge nearly straight and transverse in middle, curving posteriorly at ends, forming anterior margin of transverse flattened-oval pit sunk into inner surface of pygophore. Superior ridge produced posteriorly and notched above proctiger. Preapical tubercles of proctiger joined by curved ridge. Three small appendages protrude from conjunctiva on each side, one blackly sclerotized at acute apex, other two sometimes faintly sclerotized at apex, obtuse (Fig. 119). Sclerotized cap present at base of penisfilum. Lateral lobes of theca developed, produced posteriorly beyond median lobe (Fig. 120). Parameres robust, lateral surface strongly cupped and with narrow subapical shagreened ridge (Fig. 121).

TYPE: Male, type no. 72031, U. S. National Museum.

DISTRIBUTION: From Colombia to Sonora and Chihuahua in northern Mexico.

COMMENT: This species resembles *E. crenator* and its allied species in size and general form. From these related species it may be distinguished by the male genitalia, and with few exceptions by the nearly straight anterolateral margins and exceptionally uniform punctation of the pronotum; whereas in the related species the anterolateral margin of the pronotum is seldom straight and the punctation along this margin is usually crowded.

***Euschistus heros* (Fabricius), 1798**

Cimex heros Fabricius, 1798, p. 532.

Euschistus apicalis Dallas, 1851, p. 203.

Euschistus heros: Stål, 1868, p. 26.

Euschistus quadrimaculatus Distant, 1887, p. 62. **New Synonymy.**

Dorsum yellowish brown, deep maroon to black on humeri, ivory on apex of scutellum; punctation moderately dense, uniform excepting numerous lacunae on hemelytra, mostly castaneous, usually with numerous black punctures about cicatrices, on basal disk of pronotum, in four vague maculae at base of scutellum and macula in center of scutellar disk. Ventral surfaces brighter, more finely punctate than dorsum; three diffuse vittae on abdominal venter, one mesial, one on each side covering mesial end of pseudosutures, all occasionally obscure; sutures between spiracular lines much darker than adjacent sclerites. Length without membranes 9.7–12.8 mm.

Head a little longer than wide across eyes, 2.1–2.4 mm. long, 2.0–2.2 mm. wide; lateral margins subparallel for middle third of

distance from eyes to apex; disk nearly flat; tylus surpassing juga. Antennae concolorous with disk of head, immaculate; basal segment nearly reaching apex of head; length of segments 0.6–0.8; 1.0–1.1; 1.3–1.8; 1.5–1.9; 1.6–1.8 mm. Bucculae subequal in length to basal segment of rostrum.

Pronotum 2.2–3.2 mm. long, 2.9–3.4 times as wide at humeri. Anterolateral margins closely denticulate from apex onto humeri; denticles concolorous with disk. Humeri strongly produced laterad, rising well above pronotal disk, usually spinose, occasionally only acutely angular (Figs. 122, 123).

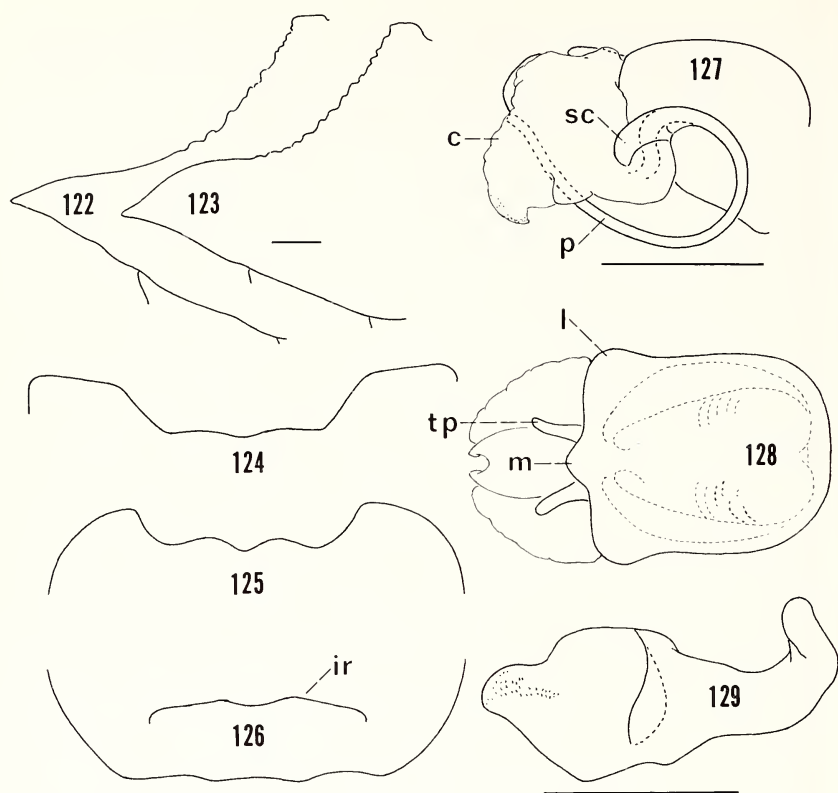
Scutellum a little longer than wide, 3.5–4.6 mm. long, 3.4–4.4 mm. wide, with moderately large deep black fovea at basal angles; apex ivory. Membrane of hemelytra clear to fumose; veins brown, simple or furcate. Connexiva castaneous, alternated with hazily defined yellowish brown spot along lateral border of each segment.

Pleural surfaces with four small black spots on each side, lacking spot at anterolateral angles of pronotum. Evaporative areas usually finely punctate with black, rarely entirely unicolorous. Legs concolorous with thoracic venter, immaculate or finely dotted with fuscous. Spiracles usually black or ringed with black.

Posterior margin of pygophore subquadrately emarginate in caudal view, sinuous at bottom of emargination (Fig. 124), concavely and sinuously emarginate in ventral view (Fig. 125), sinuously truncate in dorsal view (Fig. 126). Inferior ridge slightly overhanging excavation between ridge and posterior margin. Superior ridge sinuously produced above proctiger. Low black tubercle located on lateral carina anterolaterad of paramere on each side of genital cup. Tubercles of proctiger prominent, joined by ridge curving cephalad. Parameres robust, rather linear, with small, shagreened surface (Fig. 129). Two conjunctival appendages on each side, one acute and sclerotized at apex, other smaller, entirely hyaline (Fig. 127). Penis-filum with pronounced sclerotized cap at base. Thecal processes relatively short; median thecal lobe, but not lateral lobes, produced caudad (Fig. 128).

TYPE: Female, in Universitetes Zoologiske Museum, Copenhagen. Type examined.

SYNONYMY: The type specimen of *Euschistus quadrimaculatus* Distant, borrowed from the Institut Royal des Sciences Naturelles de Belgique, is lighter in color than most specimens of the species and the black punctures along the cicatrices are therefore more conspicuous than usual. In other respects this specimen is ordinary. The type of *E. apicalis* Dallas was examined.



FIGS. 122-129. *E. heros*. Figs. 122-123. Variation in humeral angle. Fig. 124. Posterior margin of pygophore, caudal aspect. Fig. 125. Posterior margin of pygophore, ventral aspect. Fig. 126. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 127. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 128. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m), thecal processes (tp). Fig. 129. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

DISTRIBUTION: Found in most of South America but apparently not abundant. May occur in Panama.

COMMENT: This species is most likely to be confused with *E. atrox*. In *E. heros* the apex of the scutellum is conspicuously pale bordered; in *E. atrox* the apex of the scutellum is either uniformly dark colored or very narrowly and inconspicuously pale bordered. Of

the two species, *E. heros* is generally the more robust and the dorsum is usually darker, contrasting less strongly with the black humeri.

Euschestus ***integer*** Stål, 1872

Euschestus integer Stål, 1872, p. 28.—Distant, 1880, p. 60 Pl. 7 fig. 5.

Dorsum brownish yellow; rather densely, somewhat unevenly and lightly punctured with castaneous to black. Ventral surfaces sordid yellow; punctation concolorous or slightly darker, rather weak and dense. Length without membrane 10.2–11.0 mm.

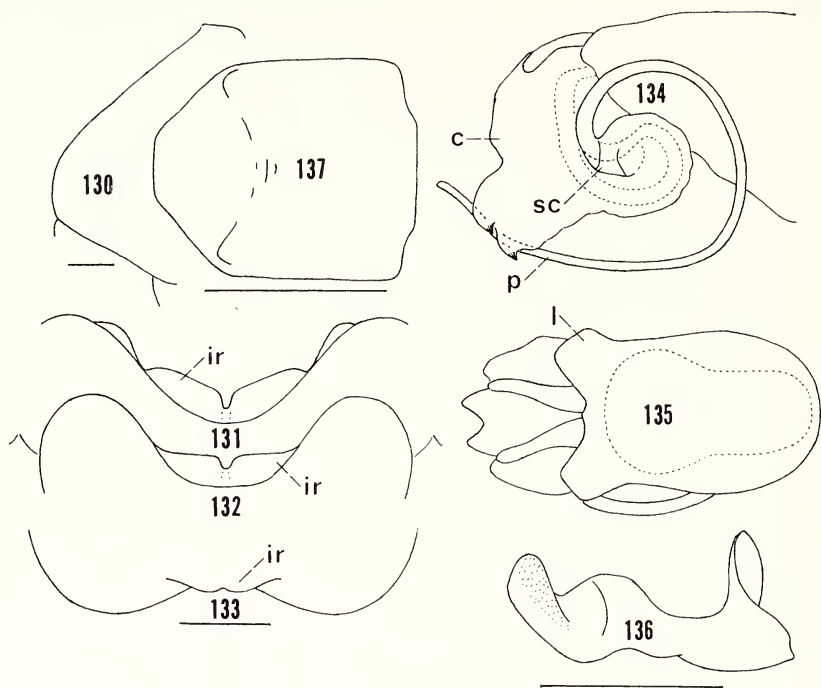
Head a little broader across eyes than long, 2.2–2.4 mm. wide, 2.1–2.2 mm. long. Lateral margins of juga tapering from eyes to rounded apex, subequal to tylus in length. Basal three antennal segments with fuscous dots, usually most conspicuous on basal segment; apical two segments immaculate, darker; length of segments 0.6; 0.9–1.1; 1.0–1.2; 1.4–1.5; 1.4–1.6 mm. Bucculae slightly exceeding basal segment of rostrum.

Pronotum 2.3–2.5 mm. long at meson, 2.4–2.6 times as wide at humeri. Disk rather flat before humeri, depressed posterolaterad of each cicatrice. Anterolateral margins straight or slightly convex, lightly reflexed, often with a few punctures darker and larger than others, entire or undulating apically (Fig. 130). Humeri scarcely produced, rounded.

Width and length of scutellum subequal, 3.6–4.0 mm. wide at base; fovea in basal angles small, composed of a few more or less confluent punctures; apex usually pale, concolorously punctate. Membrane of hemelytra faintly brown, occasionally much darker basally; veins simple or branched at base. Connexiva moderately exposed, alternated.

Thorax with five dark spots on each side; evaporative areas unicolorous. Legs conspicuously dotted with fuscous. Ventral surfaces occasionally flecked with pale red. Lateral margins of abdominal sternites with linear black mark at basal angles; apical angles immaculate or minutely black. Spiracles concolorous with supporting sclerites.

Posterior margin of pygophore deeply and broadly concave, exposing most of inferior ridge in caudal view (Fig. 131) and much of it in ventral view (Fig. 132). Lateral walls of genital cup bear several prominent black carina radiating from point on anterolateral margin of opening into genital cup. Inferior ridge notched mesially, membranous beneath notch, tuberculate laterally, projecting convexly from dorsal view (Fig. 133). Superior ridge above proctiger little



FIGS. 130–137. *E. integer*. Fig. 130. Pronotum. Fig. 131. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 132. Posterior margin of pygophore, ventral aspect; inferior ridge (ir). Fig. 133. Posterior margin of pygophore, dorsal aspect; inferior ridge (ir). Fig. 134. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 135. Theca and related structures, dorsal aspect; lateral lobes (l). Fig. 136. Right paramere, lateral aspect. Fig. 137. Proctiger. Dimensional lines equal 0.5 mm.

produced, shallowly and broadly emarginate at apex. Proctiger armed with preapical tubercle on each side of shallow, broad impression (Fig. 137). Two small appendages on each side of conjunctiva, both sclerotized and acute at apex (Fig. 134). Penisfilum with sclerotized cap at base. Lateral lobes of theca strongly produced, obliquely truncate (Fig. 135). Parameres not strongly cupped, somewhat incrassate at apex (Fig. 136).

TYPE: Female, in Naturhistoriska Riksmuseum, Stockholm. Not seen.

DISTRIBUTION: From Morelos to Sonora in Mexico.

COMMENT: The slightly reflexed anterolateral margins of the pronotum separate this species from those specimens of *E spurculus* in which this margin only undulates.

***Euschistus lineatus* Walker, 1867**

Euschistus lineatus Walker, 1867, p. 245.—Distant, 1880, p. 60, Pl. 6 fig. 12 (type figured).

Dingy, brownish yellow, sometimes with faint suffusions of red on dorsum and brighter red flecks on ventral surfaces; impunctate fascia traversing pronotum behind cicatrices and another between humeri; similar, longitudinal fascia located intramarginally on each side of scutellum and along veins of corium. Punctuation on dorsum fuscous, most densely arranged along margins of impunctate fasciae and pronotal denticles. Length 9.9 mm.

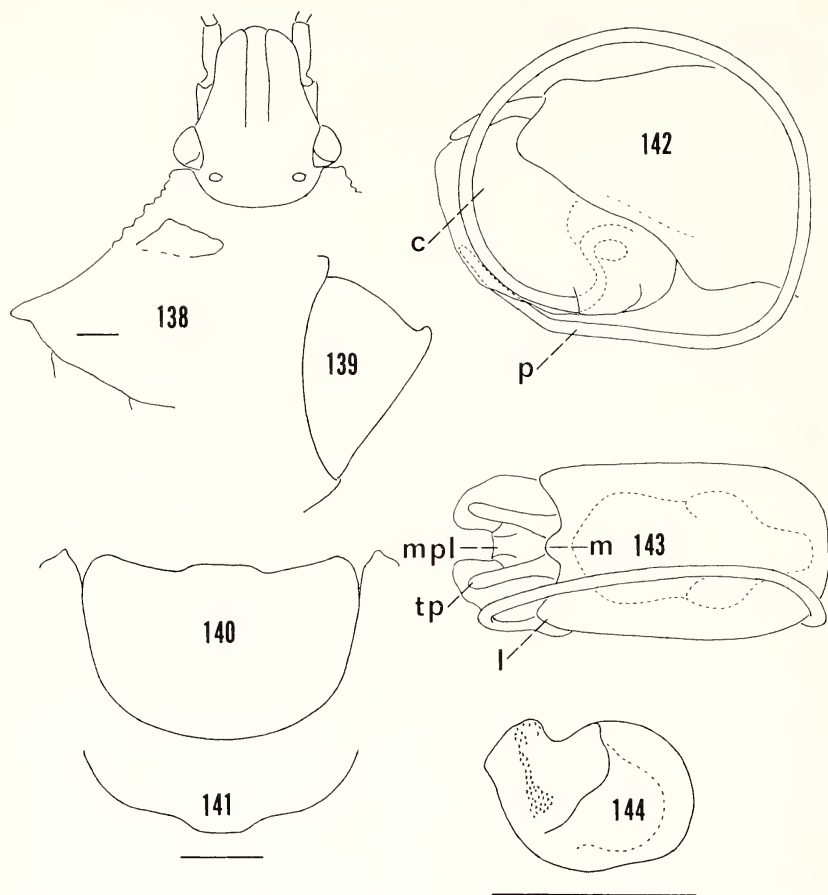
Lateral margins of head only slightly sinuate, converging very gradually to rather narrowly rounded apex (Fig. 138); juga and tylus subequal in length; width of head through eyes and length subequal, 2.1 mm. wide. Basal segment of antennae reaching apex of head; length of segments 0.6; 0.8; 1.3; 1.5; 1.5 mm.; color darkening from murky brownish yellow at base to fuscous at apex, with numerous, fine, dark dots on basal segment. Bucculae slightly longer than first rostral segment, evanescent at base of head.

Pronotum 2.5 mm. long at meson, 6.1 mm. wide at humeri. Apical half of anterolateral margins closely denticulate; denticles concolorous with disk, bordered mesially by narrow band of dense punctuation. Humeral angles produced laterad into short spine.

Scutellum as broad at base as long, 3.6 mm. wide; basal angles without fovea; apex punctate, not contrastingly colored. Membrane of hemelytra frosted vitreous with contrasting, fuscous, simple or furcate veins and a few small spots of same color. Connexiva narrowly exposed, fuscous with pale, dense, rather fine punctuation inside narrowly pale margin.

Pleural surfaces, including evaporative areas, and ventral surface of head with punctures of various sizes, some of them fuscous. Spots on femora and tibiae mostly quite small, fuscous, numerous. Punctures of abdomen concolorous with sclerites or reddish. Spiracles narrowly ringed with fuscous. Lateral angles of abdominal sclerites immaculate.

Broad, low, truncate, median protuberance on posterior margin of pygophore obvious in lateral, caudal and dorsal aspects (Figs. 139-141). Conjunctiva without apparent appendages (Fig. 142).



FIGS. 138-144. *E. lineatus*. Fig. 138. Pronotum and head. Fig. 139. Posterior margin of pygophore, lateral aspect. Fig. 140. Pygophore, Ventral aspect. Fig. 141. Posterior margin of pygophore, dorsal aspect. Fig. 142. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 143. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m), thecal processes (tp). Fig. 144. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

Penisfilum lacking sclerotized cap at base, forming large loop. Lateral lobes of theca produced posteriorly a little beyond median lobe, not at all laterad (Fig. 143); thecal processes much longer than median penal lobes. Parameres somewhat spherical, deeply cupped, with narrow, irregular spiculate line on lateral surface of apex (Fig. 144).

TYPE: Female, in British Museum (Natural History), London. Type examined.

DISTRIBUTION: Vera Cruz, Mexico.

COMMENT: The conspicuous impunctate fasciae on the dorsum make this rare species easy to recognize.

12, 23 **Euschistus nicaraguensis** Rolston, 1972
Euschistus nicaraguensis Rolston, 1972, p. 185.

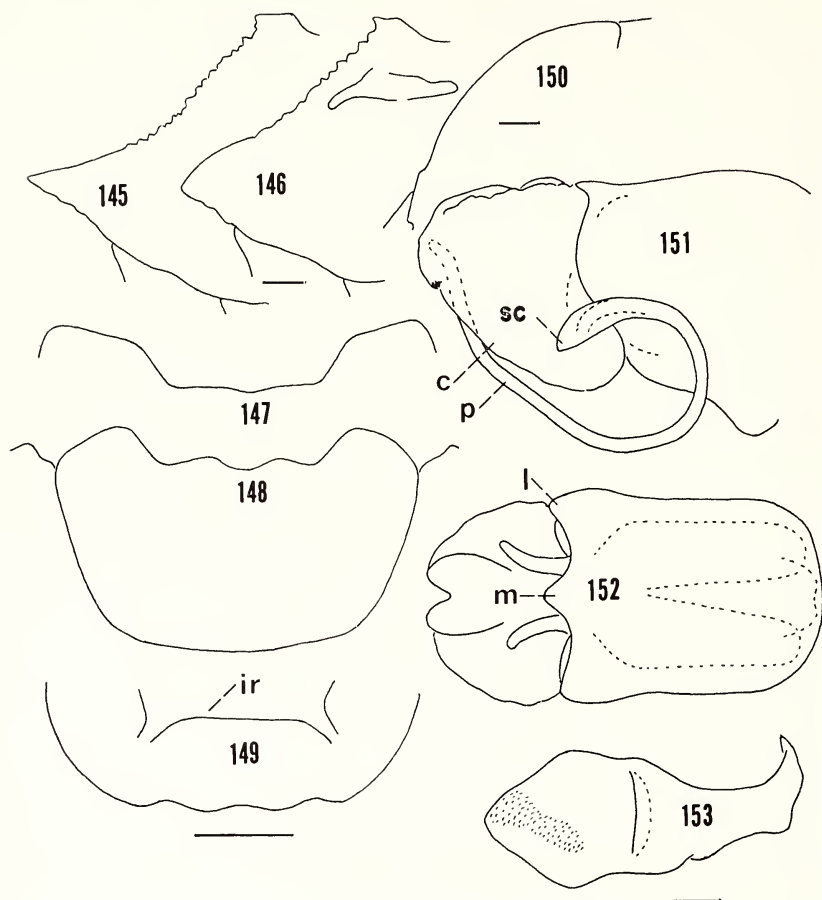
Robust, medium size, length 9.0–11.5 mm.; width at humeral angles 6.2–7.8 mm. General color blackish brown, ground color yellowish brown with moderately dense and rather uniformly distributed black punctures above and beneath, those on evaporative area finer and more sparse; small dark spots, sometimes obscure, scattered over basal three segments of antennae.

Lateral margins of head subparallel for about middle third of distance from eyes to apex. Bucculae evanescent at base of head, subequal to or slightly shorter than first rostral segment.

Anterolateral margins of pronotum unevenly concave, closely denticulate for about two-thirds distance from apex to humeral angles; humeri produced, angular to spinose, usually black, elevated, especially when spinose (Figs. 145, 146); lateral portion of cicatrices bent posteriorly, subparallel to anterolateral margin of pronotum; disk noticeably convex along meson (Fig. 150). Apex of scutellum punctate and concolorous with disk. Membrane of hemelytra frosty hyaline, unspotted; veins simple or furcate, differentiated more by form than darker color. Connexiva narrowly exposed; color darker than coria except for vaguely defined marginal area in middle of each segment.

Evaporative area sometimes reddish about black punctures. Abdominal sternites spotted with black at anterolateral angles of each segment and minutely marked with black at posterolateral angles; three vague, dark, longitudinal bands on abdomen, one mesial and one on each side closer to spiracles than to meson; margin of spiracles usually somewhat darker than surrounding surface.

Posterior margin of pygophore broadly emarginated to moderate depth in caudal view (Fig. 147); emargination broad, moderately deep, sinuous in ventral view (Fig. 148), sinuous in dorsal view (Fig. 149). Inferior ridge terminates posteriorly on each side in narrow buttress, posterior margin between these buttresses nearly straight; area between inferior ridge and posterior margin of pygophore evenly excavated except for pair of deeper almond shaped areas adjacent to inferior ridge. Superior ridge no more produced above proctiger



FIGS. 145-153. *E. nicaraguensis*. Figs. 145-146. Variation in humeral angle. Fig. 147. Posterior margin of pygophore, caudal aspect. Fig. 148. Pygophore, ventral aspect. Fig. 149. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 150. Lateral profile of pronotal disk at meson. Fig. 151. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 152. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 153. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

than on sides, not emarginated. Preapical lateral tubercles of proctiger broadly based, little elevated. Small appendage on each side of conjunctiva with apex lightly sclerotized, acute (Fig. 151). Penisfilum with sclerotized cap at base. Lobes of theca developed; median and lateral lobes about equidistantly produced posteriorly (Fig. 152). Parameres robust, rather linear; lateral surface strongly cupped; cephalic margin bearing quite long, preapical setiferous tuft, conspicuously surpassing apex of parameres (Fig. 153).

TYPE: Male, Type No. 72032, U. S. National Museum.

DISTRIBUTION: Panama to Honduras.

COMMENT: This species resembles *E. atrox*, but Westwood's species is readily separated by the flatly sloping longitudinal profile of the pronotal disk anterior to the humeri and especially by the posterior margin of the pygophore, which is trisinate from the dorsal, caudal, and ventral views.

While this species is most common on various weeds, it also feeds on cotton and rice.

12, 92 **Euschistus obscurus** (Palisot de Beauvois), 1805

Pentatoma obscura Palisot de Beauvois, 1805, p. 149, Pl. 10 fig. 9 (♀).

Euschistus bifibulus, auct. (nec Pal. Beauv.): Van Duzee, 1904, p. 48 (list).—Barber, 1906, p. 259 (list).—Barber, 1914, p. 522 (list).—

Blatchley, 1926, p. 140 (description).

Euschistus ursus Van Duzee, 1907, p. 8.

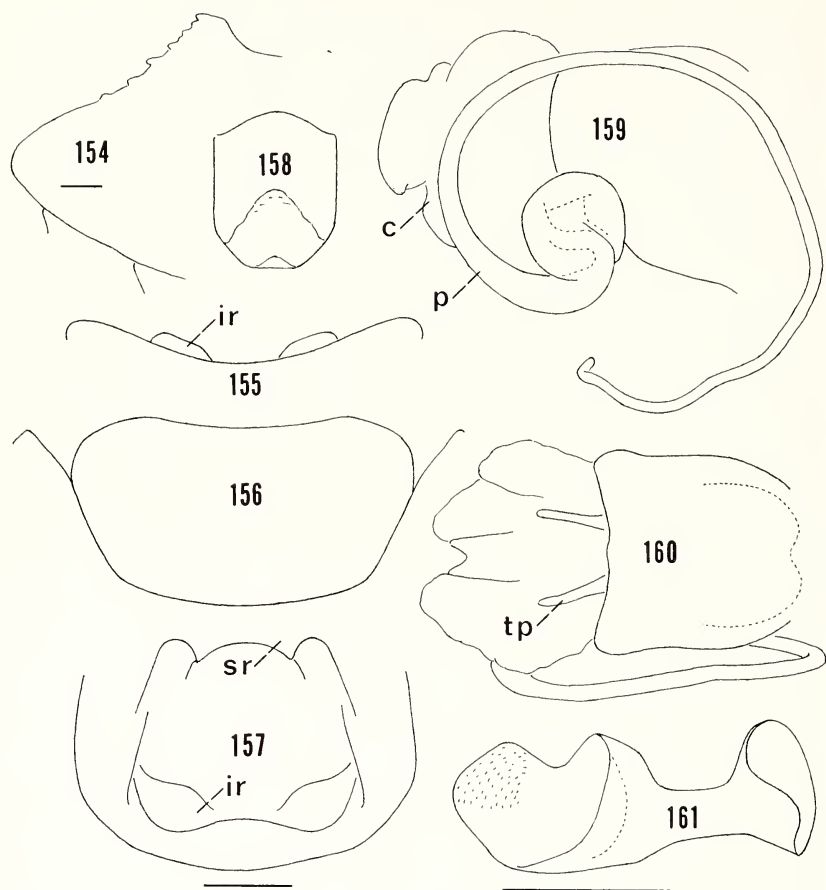
Euschistus atromaculosus Barber, 1927, p. 241.

Euschistus obscurus: Barber & Bruner, 1932, p. 255.—Torre-Bueno, 1939, p. 223 (key).—Chapin, 1959, (biology, immatures).

Posterior margin of pygophore broadly concave to moderate depth in caudal view, with part of inferior ridge exposed (Fig. 155), somewhat more than middle half very shallowly concave in ventral view (Fig. 156), broadly rounded in dorsal view (Fig. 157); inferior ridge quite tumid on each side, its posterior boundary sinuous. Superior ridge little produced, concave above proctiger. Abrupt depression beginning near middle of proctiger, expanding posteriorly to cover entire apex, containing second, small, mesial depression at apex; tubercles obscure (Fig. 158). Appendage on each side of conjunctiva faintly sclerotized at apex (Fig. 159). Penisfilum without apparent sclerotized cap. Lobes of theca poorly developed (Fig. 160); thecal processes well separated at base. Parameres strongly cupped, obtusely rounded at apex (Fig. 161).

TYPE: Female. Apparently lost.

DISTRIBUTION: Cuba, Jamaica, along the Gulf of Mexico from Florida to Tamaulipas, Mexico.



FIGS. 154-161. *E. obscurus*. Fig. 154. Pronotum. Fig. 155. Posterior margin of pygophore, caudal aspect. Fig. 156. Pygophore, ventral aspect. Fig. 157. Genital cup, dorsal aspect, omitting parameres and proctiger. Fig. 158. Proctiger. Fig. 159. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 160. Theca and related structures, dorsal aspect; thecal processes (tp). Fig. 161. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

COMMENT: The preceding description of the male genitalia is an addition to the accurate description of this species under the name *E. atromaculosus* Barber. It is one of the most distinctive species of the genus because of the numerous, small dark spots on the hemelytra,

the dense, black punctation of the head and most of the anterior pronotal disk, and the sparsely punctate fascia that joins the moderately produced and rounded humeri (Fig. 154).

// ***Euschistus ruckesi***, new species

S. 162-168

Dense black punctation of dorsum arranged more or less in rows on base of pronotum and on scutellum, with rugose, sordid yellow interstices; numerous small pale calloused spots scattered over dorsum except on head. As dark beneath as above, thickly punctured with castaneous to black. Length 9.9–10.2 mm.

Head 2.2–2.3 mm. wide across eyes, 1.9–2.1 mm. long; lateral margins tapering from eyes to broadly rounded apex (Fig. 162); vertex, base of tylus and adjoining disk somewhat elevated, head otherwise nearly flat. Antennal segments ringed with fuscous apically, narrowly on two basal segments, about half of third, two thirds of apical two segments; two basal segments additionally dotted or streaked; basal segment nearly reaching apex of head; length of segments 0.6–0.7; 0.8; 0.8–0.9; 0.9–1.2; 1.3 mm. Bucculae obtusely toothed anteriorly, evanescent at base of head, subequal in length to basal segment of rostrum.

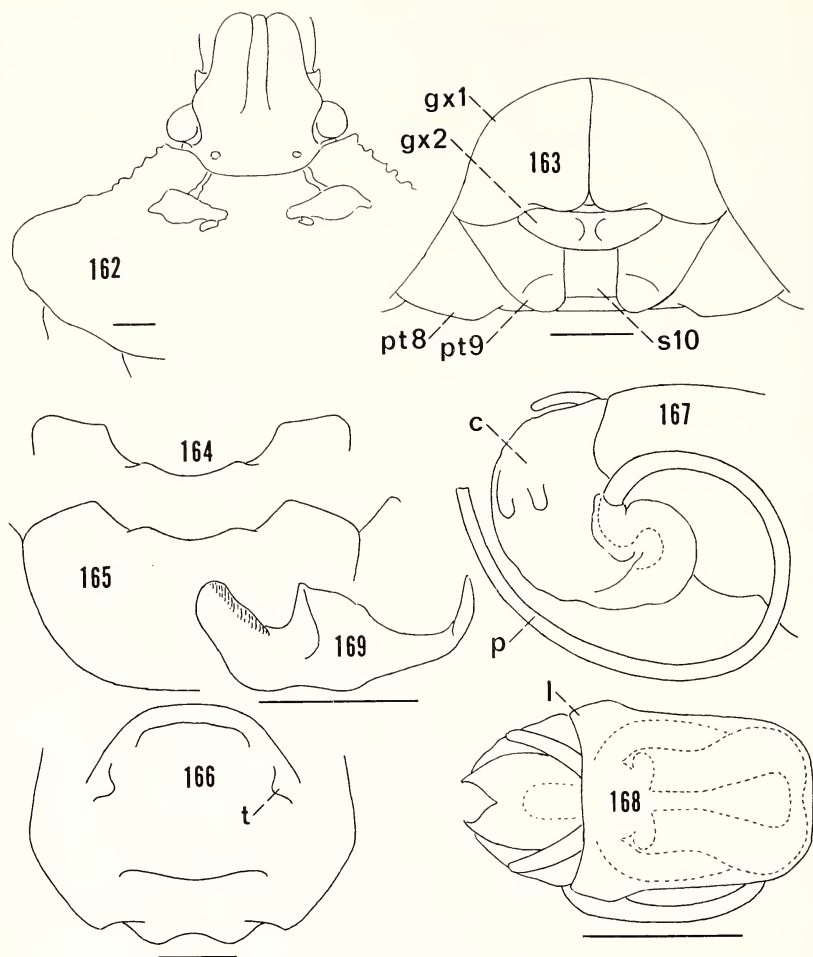
Pronotum 2.2–2.4 mm. long at meson, 5.9–6.4 mm. wide across humeri. Pale calloused spot near posteromesad border of each cicatrice and pair of pale streaks converging toward head, each arising from middle of anterior border of cicatrice. Anterolateral margin with pale denticles. Humeri moderately produced, rounded. Declivent part of disk impressed, especially posterolaterad of cicatrices.

Scutellum longer than wide, 3.2–3.7 mm. across base, 3.6–3.9 mm. long; disk rather rough; fovea at basal angles obscure. Costal margin of hemelytra reflexed at very base; membrane small, brownish, with a few sparsely branched veins. Connexiva rather broadly exposed, fuscous, obscurely alternated. Abdomen at level of scutellar apex as broad as pronotum across humeri, unusually convex.

Evaporative areas with fine, dark punctures. Black spots on legs large on femora, smaller and somewhat faded on broadly sulcate tibiae. Spiracles ringed with black. Lateral angles of abdominal sternites immaculate.

Right first gonocoxa slightly overlapping left at base (Fig. 163). Second gonocoxa depressed mesially. Ninth paratergite longitudinally concave near base, elevated and obtuse at apex. Tenth sternite nearly square.

Mesial half of posterior margin of pygophore concavely emarginate in both caudal and ventral aspects, sinuous at bottom of concavity



FIGS. 162-169. *E. ruckesi*. Fig. 162. Head and pronotum. Fig. 163. Female genital plates; first gonocoxa (gx1), second gonocoxa (gx2), eighth paratergite (pt8), ninth paratergite (pt9), tenth sternite (s10). Fig. 164. Posterior margin of pygophore, caudal aspect. Fig. 165. Pygophore, ventral aspect. Fig. 166. Genital cup, dorsal aspect, with proctiger and parameres removed; superior ridge (sr), tubercle (t). Fig. 167. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 168. Theca and related structures, dorsal aspect; lateral lobes (l). Fig. 169. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

(Figs. 164, 165); posterior margin trisinate in dorsal aspect (Fig. 166); surface of genital cup behind inferior ridge transversely sulcate; rather large tubercle located on each lateral wall of genital cup near apex of paramere. Superior ridge entire. Preapical tubercles of procitiger obscure. Two appendages on each side of conjunctiva small, digitiform (Fig. 167). Penisfilum with annular sclerotized cap at base. Thecal lobes poorly developed (Fig. 168). Parameres slightly indented near middle of striated area from lateral aspect, shallowly cupped (Fig. 169).

HOLOTYPE: Female, labeled (a) 8 mi. S. Teziutlan, Puebla, Mexico. 6575 ft. July 30, 1955 (b) P. & C. Vaurie, Collectors. Deposited in the American Museum of Natural History.

PARATYPE: Male, Mexico, Vera Cruz nr. Huatusco, July 25-26, 1965 (LHR).

DISTRIBUTION: Mexican states of Puebla and Vera Cruz.

COMMENT: This species is dedicated to the late Prof. Herbert Ruckes who contributed much to the systematics of the pentatomids.

The abdomen of this species is unusually robust for the genus. The pale streaks arising near the middle of the anterior border of the cicatrices and converging toward the head, although obscure, will be a convenient means of recognizing *E. ruckesi* if they prove to be a consistent feature of the species.

// ***Euschistus rufimanus* Stål, 1872**

Euschistus rufimanus Stål, 1872, p. 27.

Dorsum yellowish brown, tinged with red on all or part of head, deepening to dark brown or fuscous at humeral angles; punctation moderately dense and uniform, castaneous to fuscous. Yellowish brown beneath; punctation of abdomen finer with dark punctures restricted to band across basal segment, vitta on each side mesad of spiracular line, mesial broken vitta on last two or three segments, and scattered punctures on disk. Antennae, apex of tibiae and tarsi largely rufous. Length 7.9 to 8.6 mm. without membranes.

Head as long as wide, 1.7–2.0 mm. across eyes. Tylus surpassing juga. Lateral margins of juga subparallel for middle third of distance from eyes to apex of juga, almost completely exposing antenniferous tubercles from above. Lateral outline of eyes elliptical from above, appearing to protrude to unusual degree (Fig. 170). Basal segment of antennae yellowish brown, minutely dotted with fuscous; following two segments and basal portion of fourth rufous, obscurely and minutely dotted with deeper red or brown; remainder of antennae

brown; length of segments 0.5–0.6; 0.6–0.8; 0.8–0.9; 0.7–0.9; 0.8–1.0 mm. Bucculae roundly truncate to evanescent at base of head, slightly surpassing apex of basal segment of rostrum (Fig. 171).

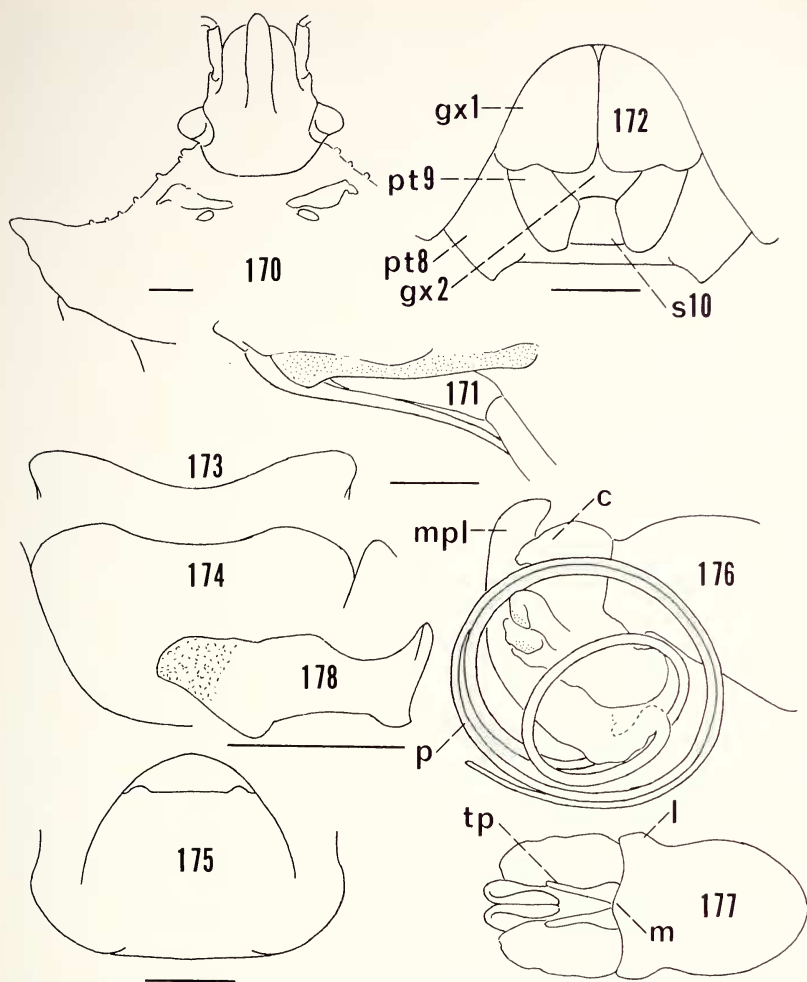
Pronotum 1.9–2.1 mm. long at meson, 2.7–3.4 times as wide at humeri. Anterolateral margins subcarinate, denticulate from apex onto humeri; denticles whitish, peg shaped, most widely separated; apex either truncate behind eyes or tapering to head. Humeri moderately elevated, angles acute, turned forward, connected by sparsely punctate subcalloused or calloused fascia. Disk convex before fascia; submarginal impression along anterior border produces collar effect around base of head; slightly calloused spot near posteromesial border of each cicatrice a little paler than disk.

Width and length of scutellum subequal, 2.8–3.4 mm. wide at base; fovea in basal angles small, deep, black; apex rather broadly rounded, narrowly bordered with ivory. Punctuation of hemelytra a little denser, finer than on scutellum; membrane frosty; veins light brown, simple or furcate. Connexiva moderately exposed; black along margin confined to macule at sutures or diffused as more or less continuous band of irregular width; density and size of punctures little greater than along costal margin of hemelytra; margin serrate, apical angles of each segment obtuse, protruding laterad of margin at base of following segment.

Evaporative areas extending about two-fifths distance from ostiole to lateral margin of supporting sclerite; more finely and sparsely punctate with castaneous or fuscous than adjacent areas. Legs yellowish brown, apex of tibiae and all of tarsi rufous, with brown or fuscous dots of small to moderate size, these numerous on femora. Peritreme of spiracles darker than surrounding area. Margin of abdominal sclerites dotted with fuscous at basal angles, indistinctly marked at apical angles.

First gonocoxae of genital plates longer than wide, concavely emarginate above ninth paratergites; posterior margin of second gonocoxae concave between ninth paratergites, apex of latter not reaching apex of abdomen (Fig. 172). Tenth sternite wider at apex than at base. Apex of eighth paratergites sub-acutely produced.

Posterior margin of pygophore shallowly, concavely emarginated in both caudal and ventral aspects (Figs. 173, 174), truncate in dorsal aspect (Fig. 175). No clearly defined inferior ridge. Preapical tubercles of proctiger prominent. Median penial lobes strongly developed, rising above dorsal plane of theca (Fig. 176). Penisfilum coiled, forming nearly four loops, without obvious sclerotized cap at base. Conjunctiva with three small appendages on each side; dorsal



FIGS. 170-178. *E. rufimanus*. Fig. 170. Head and pronotum. Fig. 171. Buccula, lateral aspect. Fig. 172. Female genital plates; first gonocoxa (gx1), second gonocoxa (gx2), eighth paratergite (pt8), ninth paratergite (pt9), tenth sternite (s10). Fig. 173. Posterior margin of pygophore, caudal aspect. Fig. 174. Pygophore, ventral aspect. Fig. 175. Genital cup, dorsal aspect, with proctiger and parameres removed. Fig. 176. Theca and related structures, lateral aspect; conjunctiva (c), median penal lobes (mpl), penisfilum (p). Fig. 177. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m), thecal processes (tp). Fig. 178. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

appendage entirely membranous, lateral appendages each bearing sclerotized plate near apex. Thecal processes incrassate at base (Fig. 177); thecal lobes moderately developed. Parameres rather linear, obscurely reticulated on lateral surface of apex (Fig. 178); tubercle on posterior margin bearing numerous setae of moderate length.

TYPE: Female, in Naturhistoriska Riksmuseum, Stockholm. Type examined.

DISTRIBUTION: Colombia, Curaçao.

COMMENT: The unusual denticulation of the anterolateral pronotal margins, elliptical shape of the eyes, protruding tylus, and often the rufous color on the appendages characterize this rather small species. It has been taken on soybeans in Colombia.

Euschistus rugifer Stål, 1872

Euschistus rugifer Stål, 1872, p. 26.—Distant, 1880 p. 59, Pl. 6 figs. 8, 9.

Dorsum sordid white to yellowish brown, punctation moderately dense, uniformly arranged; punctures mostly castaneous, black in small scattered patches occurring especially about cicatrices, base of scutellum and often on hemelytra. Yellow to orange yellow beneath, often flecked with red; concolorously punctate except dark punctures on prothorax adjacent to posterolateral border of sparsely punctate elevated area at lateral end of supracoxal cleft. Length without membranes 10.0–12.9 mm.

Head subequal in width and length, 2.1–2.5 mm. wide across eyes. Jugs shallowly impressed submarginally, lateral margins tapering slightly from concavity before eyes to moderately rounded apex of head. Antennae brownish yellow, immaculate excepting faded dots on basal segment. Basal segment reaching apex of head; length of segments 0.5–0.7; 0.9–1.2; 1.1–1.7; 1.3–1.9; 1.1–1.8 mm. Bucculae evanescent at base of head, equalled or slightly exceeded by basal segment of rostrum.

Pronotum 2.5–3.2 mm. long at meson, 2.5–3.1 times as wide across humeri. Anterolateral margin concave, denticulate from apex onto humeral angles; denticles pale, subacute, inclined toward humeral angle, irregularly spaced, several denticles often closely placed and well separated from next denticle (Fig. 179). Humeral angles acutely angulate, joined by sparsely punctate, usually calloused fascia.

Scutellar width and length subequal, 3.7–4.9 mm. wide at base; a few black punctures often clustered at basal angles but no clear fovea. Membrane of hemelytra brownish at inner angle, narrowly, irregularly so along veins, otherwise vitreous; veins usually sparingly reticulate, brown. Moderately exposed connexiva strongly alter-

nated, fuscous at base and apex of each segment, brownish yellow in middle; punctation close, rather coarse, mostly pale, obscure on light colored portion of segments.

Pleural regions of thorax with five small dark spots on each side, often only those at base of subcoxae distinct. Evaporative area often red flecked, never punctate with black. Dots on femora small, faded; tibiae essentially immaculate. Narrow, elongate, fuscous streak at basal angles of abdominal sternites; apical angles parsimoniously marked with fuscous. Peritreme of spiracles usually slightly darker than surrounding area, rarely concolorous.

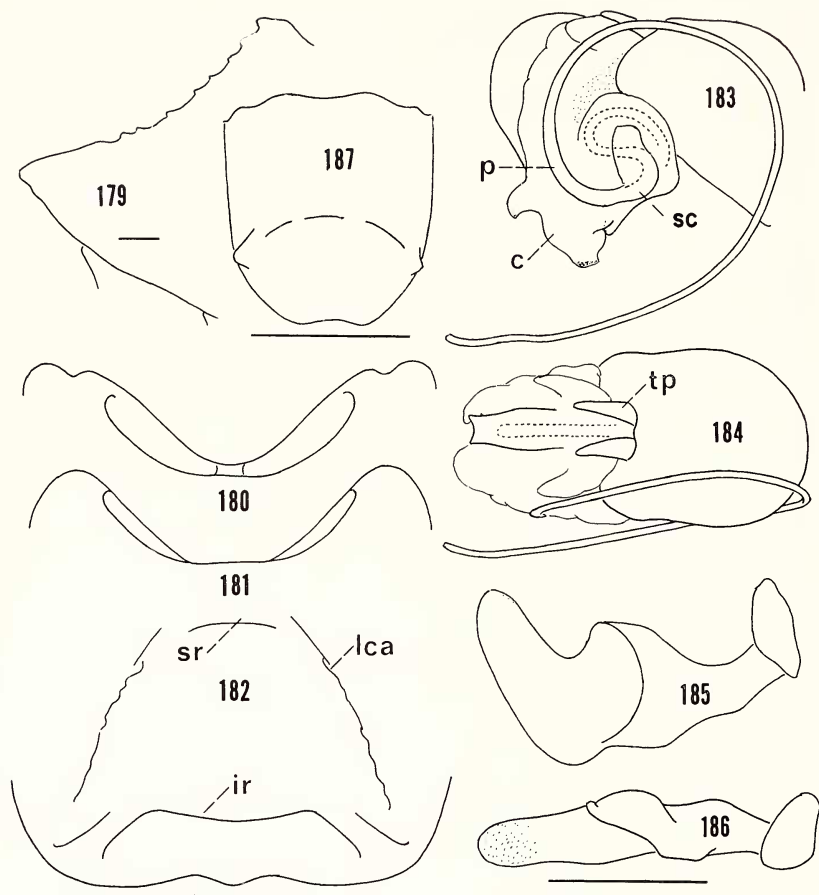
Inferior ridge largely exposed above posterior margin of pygophore in caudal view, broadly and rather deeply concave, appearing membranous mesially (Fig. 180); both inferior ridge and posterior margin of pygophore broadly concave in ventral view, former partially obscured by truncate mesial portion in concavity of latter (Fig. 181). Posterior margin of pygophore sinuous from dorsal view, with narrow convexity at meson, separated from posterior margin of inferior ridge by narrow sulcus, this limited laterally by diagonal buttresses of inferior ridge (Fig. 182); black, serrate rims of genital cup continued into cup at cephalic end as carina. Three appendages located on each side of conjunctiva, dorsal appendage digitiform and entirely hyaline, one of smaller appendages terminating in small sclerotized plate, other appendage hyaline or lightly pigmented at apex (Fig. 183). Penisfilum with large, sclerotized cap at base. Lobes of theca poorly developed; thecal processes rather short (Fig. 184). Parameres simple, margin of open cup diagonal from cephalic view (Figs. 185, 186). Proctiger strongly impressed between preapical tubercles (Fig. 187).

TYPES: The syntypes, in the Naturhistoriska Riksmuseum, Stockholm, were examined. The following specimen is designated as the lectotype: Male, labeled (a) Mexico (b) Sallé (c) Type (d) Typus (e) 5922 (f) Riksmuseum Stockholm.

The remaining specimens of the syntypes are designated as paralectotypes.

1. Male, labeled (a) Mexico (b) Sallé (c) ♂ (d) Type (e) Paratypus (f) 5722 (g) Riksmuseum Stockholm.
2. Male, labeled (a) Mexico (b) Boucard (c) Type (d) Paratypus (e) 5822 (f) Riksumuseum Stockholm.
3. Female, labeled as above except (d) Allotypus (e) 6022.
4. Female, labeled as above except (b) Sallé (e) 6122.

DISTRIBUTION: From Chiapas to Sonora in Mexico.



FIGS. 179-187. *E. rugifer*. Fig. 179. Pronotum. Fig. 180. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 181. Posterior margin of pygophore, ventral aspect. Fig. 182. Genital cup, dorsal aspect, omitting parameres and proctiger; inferior ridge (ir), lateral carina (lca), superior ridge (sr). Fig. 183. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 184. Theca and related structures, dorsal aspect; thecal processes (tp). Fig. 185. Right paramere, lateral aspect. Fig. 186. Right paramere, cephalic aspect. Fig. 187. Proctiger. Dimensional lines equal 0.5 mm.

COMMENT: *E. rugifer* resembles *E. bifibulus* but the two species differ in many features. The brownish inner angle of the otherwise nearly vitreous membrane and, commonly, the sparsely reticulated venation of *E. rugifer* contrast with the entirely fumose membrane and simple venation of *E. bifibulus*. *E. rugifer* is generally more robust than *E. bifibulus* and usually differs further in having the peritremes of the spiracles dusky, the basal disk of the scutellum roughly tumose, and the fascia between the humeri colloused. The male genitalia afford infallible means of distinguishing between the two species.

10

Euschistus schaffneri, new species - 67

Dorsum light yellowish brown; somewhat thinly punctate except at base of scutellum; punctures mostly light castaneous, black punctures scattered on head, along anterior and anterolateral pronotal margins, and costal margin of hemelytra, especially near base. Ventral surfaces whitish yellow, concolorously punctate. Length without membranes 8.5-9.4 mm.

Head a little wider across eyes than long, 2.1 mm. wide, 1.9-2.0 mm. long; lateral margins subparallel for middle third of distance from eyes to broadly rounded apex. Jugal little or no longer than tylus. Basal three segments of antennae sordid yellow, irregularly dotted with fuscous; third segment darker toward apex, two apical segments fuscous excepting basal quarter to third of each; length of segments 0.5-0.6; 0.8; 0.8-1.1; 0.9-1.0; 1.2 mm.

Pronotum 2.0-2.3 mm. long, 2.5-2.6 times as wide at humeri. Anterolateral margins nearly straight, broadly reflexed, undulating to obtusely denticulate on apical half or less (Figs. 188, 189). Humeri little produced, broadly rounded. Disk deeply impressed submarginally posterolaterad of somewhat obscure cicatrices.

Scutellum about as broad at base as long, 3.1-3.5 mm. long; fovea in basal angles obscure; apex punctate. Costal margin of hemelytra narrowly but distinctly reflexed along basal third; membrane small, subcircular, fumose; veins incompletely reticulate. Connexiva rather broadly exposed; black along lateral margins fading mesad to castaneous, narrowly alternated with sordid yellow in middle of each segment; punctuation pale, coarse, close, obscure in sordid yellow bands.

Pleural region of thorax with five black spots on each side; spot at anterolateral angle of pronotum composed of numerous more or less discrete black punctures. Legs rather sparsely ornated with small

black dots. Large black arcuate dot at basal angles of abdominal sternites. Spiracles concolorous with supporting sclerites.

Posterior margin of pygophore emarginate on both sides of mesial lobe, trisinate in caudal, ventral and dorsal views (Figs. 190-192). Superior ridge notched mesially. Inferior ridge lacking. Conjunctiva with median appendage dorsad of median penal lobes and large appendage on each side, all hyaline (Figs. 193, 194). Penisfilum emerging mesially. Lateral lobes of theca surpassing median lobe, not expanded laterad. Parameres nearly uniform in breadth distad of cup, with barely roughened area on lateral surface (Fig. 195). Well developed tubercles on proctiger placed nearly midway between base and apex, nearer apex (Fig. 196).

HOLOTYPE: Male, labeled 20 mi. E. of Concordia, Sinaloa, Mexico. Sept. 2, 1957. J. C. Schaffner. Type no. 72127, U. S. National Museum.

PARATYPES: 2 ♂♂, 1 ♀. Same data as holotype (♂ LHR); (a) Mexico, Jalisco, 3 mi. S. "Mazamita" (or "Mazamitla"), V-10-1963 (b) W. J. Gertsch, W. Ivie (♂ AMNH, ♀ TAMU).

DISTRIBUTION: Mexican states of Sinaloa and Jalisco.

COMMENT: I take great pleasure in naming this species for Prof. J. C. Schaffner as a token of gratitude for his consistent support.

The deep submarginal impressions and broadly reflexed antero-lateral margins of the pronotum, and the lightly reflexed basal third of the costal margins and small, subcircular membrane of the hemelytra distinguish this species.

***Euschistus servus servus* (Say), 1832**

Pentatoma serva Say, 1832, p. 4.—Say, 1859, p. 314.

Pentatoma spilota [Westwood] 1837, p. 42.

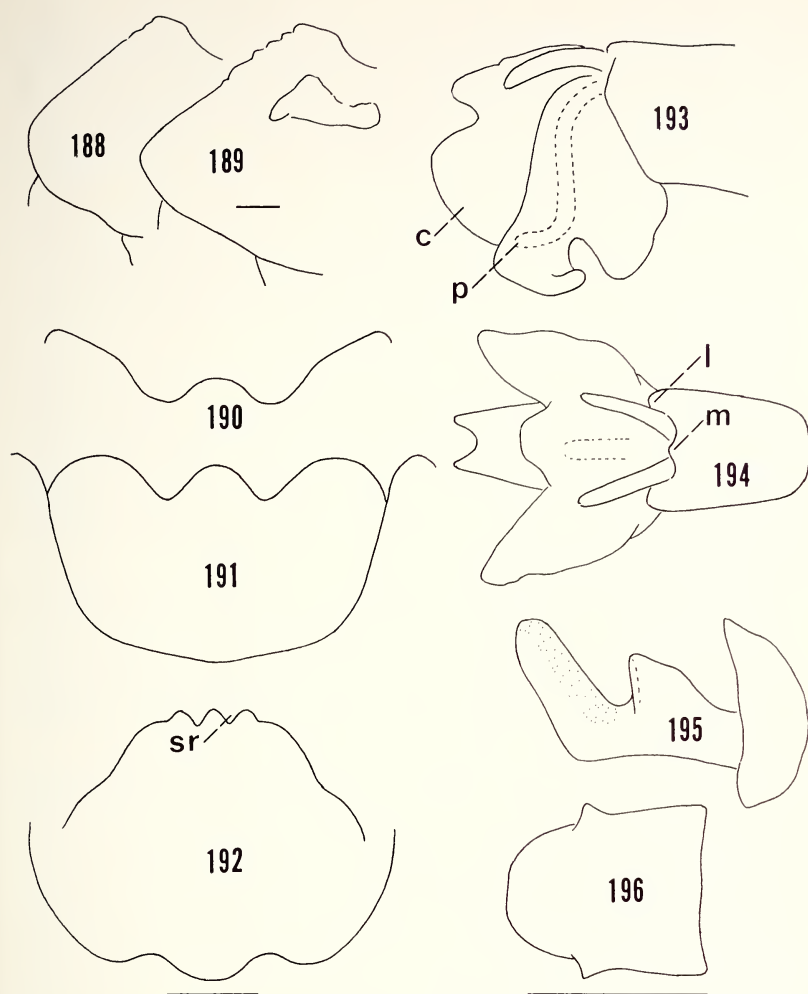
Euschistus servus: Stål, 1872, p. 26.—Van Duzee, 1904, pp. 44, 45.—

Foote and Strobell, 1914, p. 337.—Blatchley, 1926, p. 130 (description).—Torre-Bueno, 1939, p. 221 (key).—Sailer, 1954, p. 377 (hybridization).—Rolston, 1961, p. 151 (biology).

Euschistus impictiventris Stål, 1872, p. 26.—Van Duzee, 1904, pp. 44, 45.—Torre-Bueno, 1939, p. 221 (key). **New Synonymy.**

Dorsum light yellowish tan to dark brown, occasionally tinged with red, somewhat sparsely and unevenly punctate with castaneous to black, without callouses or more than an occasional dark spot. Sordid white to brownish yellow beneath, sometimes tinged with green or flecked with red; concolorously punctate. Length without membranes 10.8–14.1 mm.

Length and width of head subequal, 2.4–2.9 mm. wide across



FIGS. 188-196. *E. schaffneri*. Figs. 188-189. Variation in denticulation and humeral angles of pronotum. Fig. 190. Posterior margin of pygophore, caudal aspect. Fig. 191. Pygophore, ventral aspect. Fig. 192. Outline of genital cup; superior ridge (sr). Fig. 193. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p). Fig. 194. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 195. Right paramere, lateral aspect. Fig. 196. Proctiger. Dimensional lines equal 0.5 mm.

eyes. Juga usually slightly longer than tylus, lateral margins subparallel for middle third of distance from eyes to apex. Antennae brownish yellow, apical two segments often a little darker, often a few dots on basal segments, otherwise immaculate; basal segment not quite reaching apex of head; length of segments 0.7–0.8; 1.1–1.2; 1.2–1.5; 1.3–1.6; 1.6–1.8 mm. Bucculae evanescent at base of head, subequal in length to basal segment of rostrum.

Pronotum 2.7–3.5 mm. long at meson, 2.6–2.8 times as wide at humeri. Concave anterolateral margins closely denticulate about half way from apex to humeral angles; denticles concolorous with or paler than disk. Humeral angles rounded to acutely angular (Figs. 197–199).

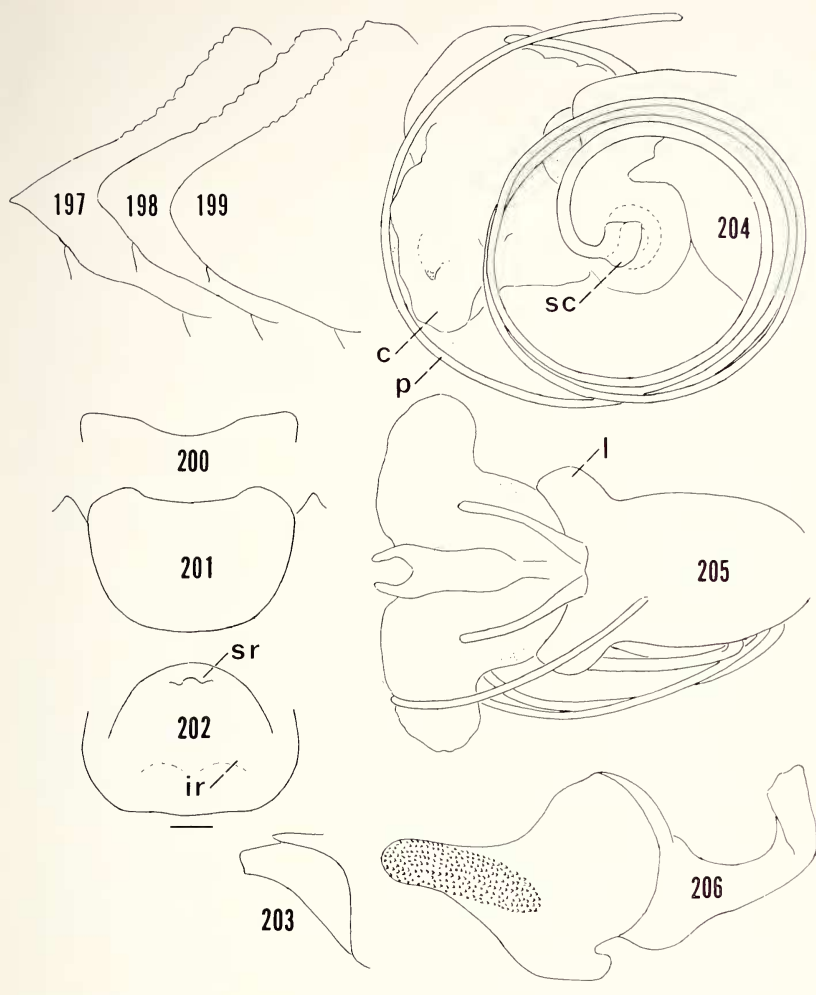
Scutellar breadth and length subequal, 4.0–5.4 mm. wide at base, with a few black punctures clustered in basal angles forming weak fovea; margin of apex usually indistinctly pale. Membrane clear to slightly fumose, with numerous small dark spots, these sometimes obscure; veins simple or furcate. Connexiva narrowly to broadly exposed, alternated with castaneous to fuscous band along intersegmental sutures.

Pattern of five black dots on each side of thorax frequently incomplete, sometimes lacking; evaporative area uniformly colored. Legs with small blackish dots on femora and tibiae, or immaculate. Spiracles concolorous with sternites. Small black dot at basal angles of abdominal sternites rarely absent; apical angles often minutely blackened at very apex.

Pygophore labiate in lateral view (Fig. 203); posterior margin shallowly concave along middle half in caudal view (Fig. 200), more broadly, somewhat rectangularly emarginate in ventral view (Fig. 201), truncate, slightly sinuous in dorsal view (Fig. 202). Inferior ridge not clearly defined. Superior ridge roundly notched at meson. Small appendage on each side of conjunctiva sclerotized at apex (Fig. 204). Penisfilum coiled in three loops. Lateral lobes of theca large, median lobe obscure (Fig. 205). Apex of parameres digitiform, posterior margin with blunt hook directed basad (Fig. 206). Tubercles on proctiger preapical.

TYPE: Apparently lost.

SYNONYMY: The form described by Stal as *E. impictiventris* is characterized mainly by a paler brown dorsum and acute humeral angles, a combination of characters prevailing in the southwestern United States. The coloration of the dorsum is a cline following Gloger's Rule of variation, i.e. individuals from arid regions are generally paler in color than those from humid regions. Individuals with



FIGS. 197-206. *Euschistus servus servus*. FIGS. 197-199. Variation in humeral angles. FIG. 200. Posterior margin of pygophore, caudal aspect. FIG. 201. Pygophore, ventral aspect. FIG. 202. Genital cup, dorsal aspect, omitting parameres and proctiger; inferior ridge (ir), superior ridge (sr). FIG. 203. Profile of pygophore, right lateral aspect. FIG. 204. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). FIG. 205. Theca and related structures, dorsal aspect; lateral lobes (l). FIG. 206. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

acute humeral angles are not confined to the southwest and occur commonly throughout the southern range of the species. The genitalia are alike in specimens diverging in color and in the form of the humeri. The type of *E. impictiventris* was not examined.

DISTRIBUTION: Middle American distribution is confined to the Mexican – USA border region.

***Euschistus spurculus* Stål, 1862**

Euschistus spurculus Stål, 1862, p. 100—Stål, 1872, p. 28.—Distant, 1880, p. 59, Pl. 6 fig. 10.

Dark brown dorsum with black punctation thickest on head and scutellum, moderately dense elsewhere. Sordid white to pale yellow beneath, concolorously punctate. Body depressed, length 7.7–9.5 mm. without membranes.

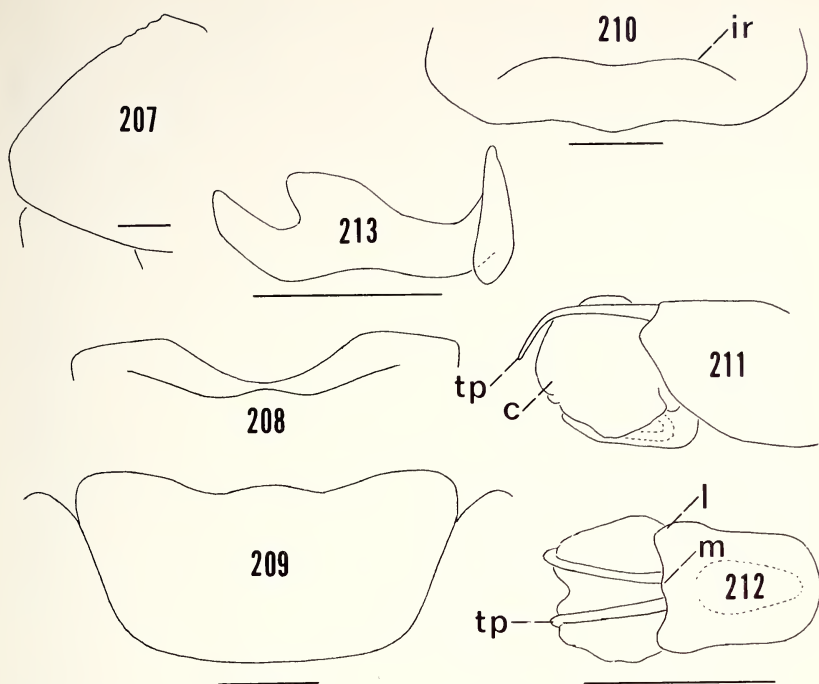
Head a little broader across eyes than long, 1.8–2.1 mm. wide, 1.6–1.9 mm. long. Jugal slightly depressed submarginally; lateral margins tapering from eyes to broadly rounded apex. Basal three antennal segments thickly dotted with black; apical two segments entirely black; length of segments 0.5–0.6; 0.6–0.7; 0.7–0.9; 0.9–1.0; 1.2–1.4 mm. Bucculae evanescent at base of head, surpassing apex of first rostral segment.

Pronotum 1.6–2.0 mm. long at meson, 2.6–2.8 times as wide at humeri. Anterolateral margins nearly straight, near apex with weak obtuse denticles, occasionally merely undulating (Fig. 207). Disk impressed submarginally along anterior and anterolateral margins, especially posterolaterad of cicatrices. Humeri weakly produced, rounded.

Scutellum usually a little longer than wide, 2.6–3.2 mm. wide at base, 2.8–3.4 mm. long; apex punctate; fovea at basal angle obscure or wanting. Membrane of hemelytra dark; veins simple. Connexiva moderately exposed, fuscous alternated with sordid yellow at middle of each segment; punctuation coarse, close, pale.

Pleural regions with five black spots on each side; spot at anterolateral angle of prothorax reduced to a few black punctures. Evaporative area unicolorous. Legs thickly spotted with black. Spiracles concolorous with supporting sclerites. Abdominal sternites black at basal angles.

Posterior margin of pygophore sinuous, convex at meson in caudal, ventral and dorsal views (Figs. 208–210). Inferior ridge prominent in caudal view, with broad deep mesial concavity, its posterior margin sinuous and convex mesially from dorsal view. Superior ridge strongly produced with deep concave mesial emargination. Black

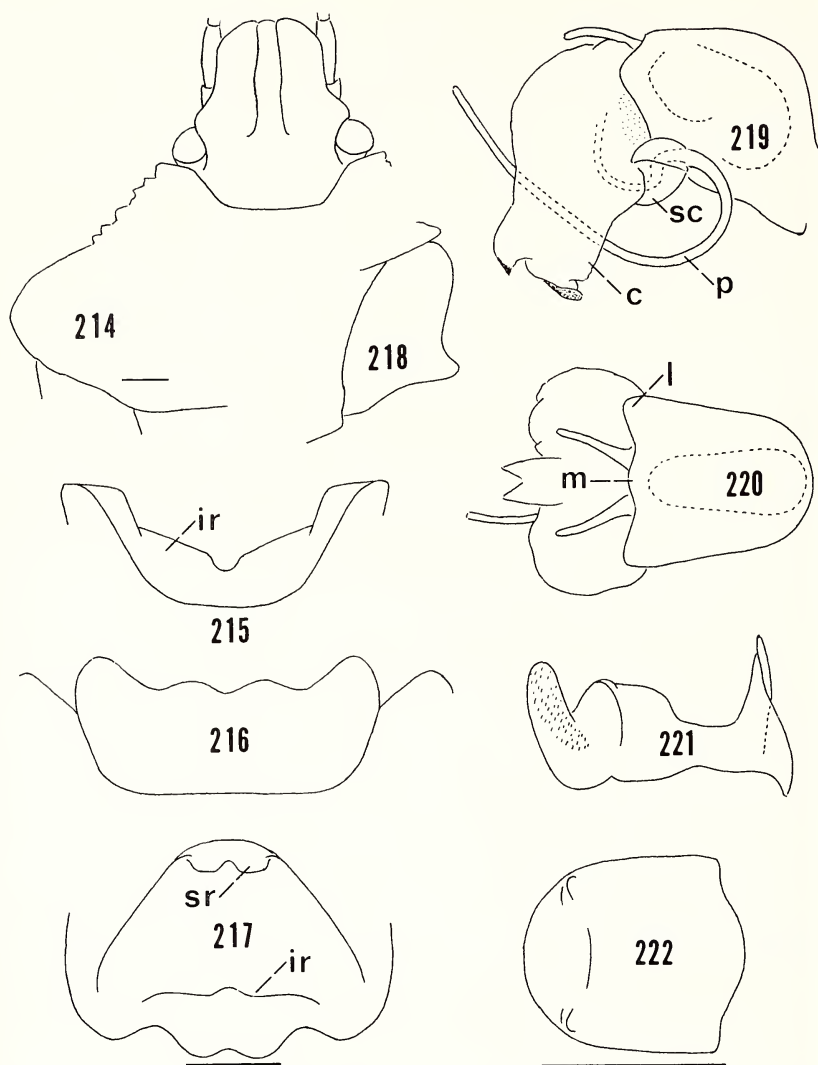


FIGS. 207–213. *E. spurculus*. Fig. 207. Pronotum. Fig. 208. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 209. Pygophore, ventral aspect. Fig. 210. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 211. Theca and related structures, lateral aspect; conjunctiva (c), thecal processes (tp). Fig. 212. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m), thecal processes (tp). Fig. 213. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

denticle on lateral walls of genital cup located near base of parameres. Thecal processes long, thin (Fig. 211). Penisfilum emerging ventrally at meson. Lobes of theca weakly produced (Fig. 212). Spatulate apex of parameres aciculate on surface opposing shallow cup (Fig. 213).

TYPE: Female, in Naturhistoriska Riksmuseum, Stockholm. Not seen.

DISTRIBUTION: From Guerrero to Chihuahua, Mexico. Reported from Arizona by Barber (1910). Apparently uncommon.



FIGS. 214-222. *E. stali*. Fig. 214. Head and pronotum. Fig. 215. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 216. Pygophore, ventral aspect. Fig. 217. Genital cup, dorsal aspect, omitting parameres and proctiger; inferior ridge (ir), superior ridge (sr). Fig. 218. Profile of pygophore, left lateral aspect. Fig. 219. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 220. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe

12 72 **Euschistus stali**, new species *f. 24-222*

Dorsum light brown; head, anterolateral and anterior borders of pronotum faintly suffused with red; punctation rather dense, fine, black along borders of head and anterolateral pronotal borders including base of denticles, otherwise castaneous shades. Ventral surfaces pale yellow, concolorously punctate, sometimes flecked with red. Length without membranes 9.1-10.8 mm.

Width and length of head subequal, 2.1-2.2 mm. wide. Lateral margins of juga subparallel for middle third of distance from eyes to apex. Juga and tylus subequal in length. Basal three antennal segments and basal fourth of last two segments pale yellow, with black dots on first three and sometimes on basal ring of fourth; apical two segments otherwise darker, immaculate; length of segments 0.5-0.6; 0.9-1.0; 0.8-1.2; 1:3; 1.4 mm. Bucculae obtusely lobed anteriorly, evanescent at base, subequal in length to first rostral segment.

Pronotum 2.1-2.5 mm. long at meson, 2.5-2.8 times as wide at humeri. Anterolateral margin nearly straight, closely denticulate along apical half; denticles pale yellow (Fig. 214). Humeri slightly produced, broadly rounded. Disk conspicuously impressed posterolaterad of cicatrices.

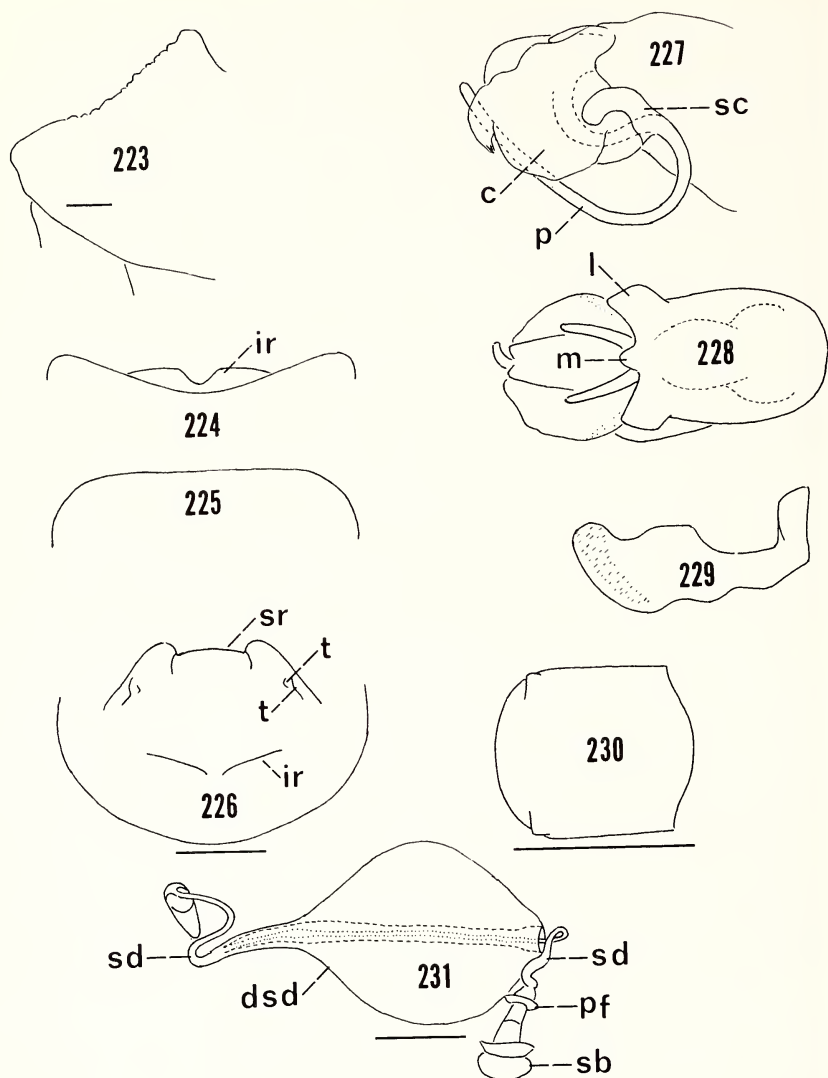
Scutelum as long as or a little longer than wide, 3.4-3.7 mm. wide, 3.4-4.0 mm. long; basal angles with small fovea; apex concolorous with disk, punctate. Membranes of hemelytra nearly clear; veins simple or furcate. Connexivum black along margin, fading mesad to light castaneous, alternating with pale yellow at middle of each segment; punctation close, coarse, pale.

Pleural surfaces of thorax with five black spots on each side. Numerous black dots on femora and tibiae well defined. Spiracles usually black, at least darker than surrounding surface. Dot at basal angles of abdominal sternites, sometimes pair of small submarginal mesial dots, black.

Ventral margin of pygophore produced posteriorly in lateral view (Fig. 218). Posterior margin of pygophore broadly and deeply concave in caudal view, entirely exposing concave posterior face of inferior ridge (Fig. 215), trisinuately emarginate in ventral view (Fig. 216), sinuously produced between lateral concavity on each side in dorsal view (Fig. 217). Superior ridge produced above proctiger, mesially notched. Preapical tubercles of proctiger flank broad con-

←

(m). Fig. 221. Right paramere, lateral aspect. Fig. 222. Proctiger. Dimensional lines equal 0.5 mm.



FIGS. 223-231. *E. egglestoni*. Fig. 223. Pronotum. Fig. 224. Posterior margin of pygophore, caudal aspect; inferior ridge (ir). Fig. 225. Posterior margin of pygophore, ventral aspect. Fig. 226. Genital cup, dorsal aspect; inferior ridge (ir), superior ridge (sr), tubercle (t). Fig. 227. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 228. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m).

cave impression (Fig. 222). Apex of parameres strongly bent, with shagreened surface (Fig. 221). Conjunctiva with two appendages on each side, one sclerotized at acute apex, other terminating in small sclerotized plate (Fig. 219). Penisfilum with sclerotized cap at base. Theca modestly lobed (Fig. 220).

HOLOTYPE: Male, labeled Mexico, Morelos, 3.6 mi. E. Cuernavaca, 4600 ft., pedregal, XI-24-65. Type no. 72128, U. S. National Museum.

PARATYPES: 3 ♂♂, 5 ♀♀. MEXICO: *Colima*: Vulcano, L. Conrad (♂ USNM, ♂ NR). *Michoacan*: Morelia, 9-22-57, R. & K. Dreisbach (♀ TAMU). *Morelos*: Cuernavaca, VII-9-61, R. & K. Dreisbach (♂, ♀ LHR); (a) Cuernavaca, X-1944 (b) on foliage *Eupatorium adenophorum* (c) N. L. H. Krauss, p. 621 (♀ BMNH). *Nayarit*: Camposella, 9-16-57, R. & K. Dreisbach (♀ MSU); (a) Jalisco, 3 mi. S. Mazamitla, V-10-1963 (b) W. J. Gertsch, W. Sire (♀ AMNH).

DISTRIBUTION: In the Mexican states of Colima, Michoacan, Morelos and Nayarit.

COMMENT: Aside from the unusual pygophore, the pale pronotal denticles with a thin line of black punctures at their base are the most conspicuous feature of this species.

STRENUUS GROUP

The three species of the *strenuus* group, *Euschistus strenuus*, *E. egglestoni* and *E. leonensis* may be distinguished most readily from the allied *crenator* and *sulcacitus* groups by the structure of the pronotum and the male genitalia. The anterolateral pronotal margins of the *strenuus* group are depressed before the humeri, and often the denticulate portion, including the denticles, is strikingly paler than the disk. The posterior margin of the inferior ridge, viewed dorsally, forms a very open V with the arms directed anterolaterad.

GROUP CHARACTERISTICS

Length 6.9–10.4 mm. Dorsum variously light grey to dark brown, lighter colors often suffused with pale red, occasionally with pale

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Fig. 229. Right paramere, lateral aspect. Fig. 230. Proctiger. Fig. 231. Spermatheca; dilation of spermathecal duct (dsd), proximal flange (pf), spermathecal bulb (sb), spermathecal duct (sd). Dimensional lines equal 0.5 mm.

green; punctation moderately dense, somewhat uneven, light castaneous to black; without calloused spots. Anterolateral margins of pronotum closely denticulate about two-thirds distance from apex to humeral angles, depressed before humeri; denticulate portion together with denticles often pale, contrasting strongly with disk. Costal margin of hemelytra at most weakly reflexed at very base; disk without numerous dark spots; membrane transparent, unspotted, veins simple or furcate. Ventral surfaces including evaporative areas, abdominal sutures and spiracles pale, often partially suffused with pea green, sometimes with pale red, occasionally flecked with pale red; punctation usually dark beneath humeral angles, often some dark punctures along margins of head, otherwise concolorous; thorax marked on each side with five black spots, basal angles of abdominal sternites with black dot.

Posterior margin of pygophore broadly concave in caudal view, partially exposing inferior ridge (Figs. 224, 234, 243), evenly convex in dorsal view (Figs. 226, 236, 245); posterior margin of inferior ridge forming very depressed V with arms directed anterolaterad in dorsal view. Area between inferior ridge and posterior margin of pygophore smoothly excavated; superior ridge scarcely projecting over proctiger, shallowly concave on posterior margin in dorsal aspect. Sclerotized cap at base of penisfilum large, heavily pigmented (Figs. 227, 237, 246). Small appendage on each side of conjunctiva terminating in acute sclerotized point. Lobes of theca well developed, lateral lobes expanded laterally (Figs. 228, 238, 247).

13. *Euschistus egglestoni*, new species

Length without membrane 8.6–9.7 mm. for males, 9.0–10.4 mm. for females; width at humeri 5.3–6.0 mm. for males, 5.4–6.5 mm. for females; length of antennal segments (both sexes) 0.5–0.6; 0.7–0.9; 0.9–1.1; 0.9–1.1; 1.1–1.2 mm.; pronotum 2.4–2.6 times as wide at humeri as long.

Humeri little produced, broadly rounded to obtusely angulate (Fig. 223). Disk of pronotum usually divided by inconspicuous, narrow, irregular, levigate fascia; punctures similar on both sides of fascia or somewhat finer anteriorly. Dorsum brownish yellow, usually much suffused with shades of red, often bright castaneous. Tergites beneath membrane light brown to black, distinctly darker than venter.

Posterior margin of pygophore truncate from ventral view (Fig. 225); lateral walls of genital cup with obtuse denticle just below and more or less separated from rim (Fig. 226), a smaller denticle entad. Penisfilum longer than in *E. strenuus*, directed cephalad upon emerg-

ing from sclerotized cap (Fig. 227). Cephalic margin of parameres somewhat truncately produced between base and apex (Fig. 229).

Spermathecal duct of female genitalia appreciably longer between orifice and dilation than in *E. strenuus*, both looped and convolute before proximal flange (Fig. 231); spermathecal bulb depressed.

HOLOTYPE: Male, labeled (a) Durango, Durango, Mexico, Wickham (b) H. G. Barber Colln, 1950. Type no. 72122, U. S. National Museum.

PARATYPES: 13 ♂♂, 8 ♀♀. MEXICO: *Chihuahua*: 2 mi. S. Matlachich, Aug. 21, 1950, Ray F. Smith (♀ AMNH); Cocomorachic, Aug. 20, 1950, Ray F. Smith (3 ♀♀, AMNH). *Colima*: 31 mi. E. Colima, VII-19-66, P. M. & P. K. Wagner (♂ TAMU); 20 mi. NE Colima VII-20-66, P. M. & P. K. Wagner (♀ LHR). *Guerrero*: 49 mi. S. Iguala, VII-12-66, P. M. & P. K. Wagner (♀ TAMU, ♀ LHR); 3 mi. S. Iguala, VII-12-66, P. M. & P. K. Wagner (♂ TAMU). *Michoacan*: 4 mi. E. Nueva Italia, VII-17-66, P. M. & P. K. Wagner (♂ LHR). *Nayarit*: 3 mi. S. Compostela, Wickham (2 ♂♂ USNM). *Sonora*: (a) Santa Cruz, X-16-45 (b) apple leaves (♀ USNM); Sonora, 9-25-52, beet tops (♂ USNM). U.S.A., *Arizona*: (a) Nogales, VIII-21-40 (b) D. J. & J. N. Knull (♀ USNM); Sabine Canyon, Sta. Catalina Mts. (♂ USNM); (a) Huachuca Mts., VIII-16-70 (b) D. J. & J. N. Knull (♂ UNLP); (a) 2 mi. NE Portal, Cochise Co., VIII-19-67 (b) J. G. Rozen, G. Krueger (♂ BMNH); (a) S.W.R.S. 5 mi. W. Portal, 5400 ft., Cochise Co., Oct. 12, 1956 (b) E. Ordway (♂ NR); Continental, VIII-13-52, W. A. Stevenson (♂ LHR).

DISTRIBUTION: From Oaxaca northward through the western Mexican states of Guerrero, Michoacan, Colima, Nayarit, Durango, Chihuahua and into Arizona.

COMMENT: This species closely resembles *E. strenuus* specimens with obtuse humeri, but the larger size of most specimens of *E. egglestoni* distinguish them from Stål's species, although there is some overlap between the two species in size. Males are readily identifiable by the relative length of the penisfilum.

This species is dedicated to the late Professor Harla Ray Eggleston, an unexcelled teacher who devoted his life to the students of Marietta College.

13,75 ***Euschistus leonensis***, new species

Length 7.8–9.1 mm. for males, 7.9–9.5 mm. for females; width at humeri 5.4–7.0 mm. for males, 5.4–6.7 mm. for females; length

of antennal segments (both sexes) 0.5–0.6, 0.7–0.9; 0.9–1.2; 1.0–1.2; 1.1–1.3 mm.; pronotum 2.5–3.2 times as wide as long.

Humeri produced, obtusely angulate to spinose; apex always black in spinose specimens and usually dark in specimens with obtusely angulate humeri (Figs. 232, 233). Anterolateral margin of pronotum and denticles pale yellow, contrasting with adjacent disk. Dorsum often heavily suffused with castaneous, especially in spinose specimens, with mildly to strongly contrasting light yellow or tan areas as follows: tylus, vertex of head, pronotum along meson from anterior margin posteriorly between cicatrices then laterad toward but not including humeri, scutellum except base, macula in center of disk, vague macula along each margin adjacent to inner angle of coria. Scutellum densely punctate behind frena excepting pair of longitudinal irregular impunctate or sparsely punctate fasciae separated by narrow mesial band of punctures, and usually excepting border of apex. Tergites beneath membrane light to dark castaneous, much darker than venter.

Posterior margin of pygophore shallowly concave from ventral view (Fig. 235). Lateral walls of genital cup with obsolete tubercle anterolaterad of parameres entad of obtuse, denticular swelling on rim of genital cup. Dorsal margin of parameres sinuous, cephalic margin truncately produced between base and apex (Fig. 239). Penisfilum relatively long, directed cephalad upon emerging from sclerotized cap (Fig. 237). Lateral conjunctival lobe on each side usually with faintly pigmented ventral disk.

Spermathecal duct of female genitalia quite long between orifice and membranous enlargement, not convoluted before proximal flange (Fig. 240); spermathecal bulb nearly hemispherical.

HOLOTYPE: Male, labeled Managua-Leon Hwy. Nicaragua. 19-VI-69. Ev. Vogel, Coll. Type no. 72123, U. S. National Museum.

PARATYPES: 21 males and 20 females. NICARAGUA: Leon, 18-VI-68, G. Peterson (♀, LHR); Chinandega, Baker (b) 3209 (c) P. R. Uhler Collection (♂ USNM); La Calera, Nov. 28, 1956, En tomato, F. A. Estrada (♂ USNM); No. 444-3638, Date 6-VII-64, Loc. Metapan, Col. MSU (♀ USNM); same data as holotype (♀ LHR); Altamira, Boaca, 3-XII-69 (b) Ev. Vogel (♂ LHR); Matagalpa, 26-VII-70 (b) L. H. Rolston (♀ LHR); Tipitapa, Managua, 20-VII-70 (b) L. H. Rolston, (♂ LHR); El Paso, Penaloya, Grenada, 20-VI-1970, Weeds, Ev. Vogel (♀ LHR); Santa Rita, Managua, 22-VII-70 (b) L. H. Rolston (♀ NMW, ♂ LHR); Jiloa, Managua, 2-VII-70 (b) L. H. Rolston (♀ MHB); Altamira, Managua, Nov-Dec, 1970 E. Moore (♂ MHB); Peña Blanca, Rivas, 24-VII-70 (b) L. H.

Rolston, (♂ NMW); Posoltega, Chinandega, 23-VII-70 On Sesame (b) L. H. Rolston (♂ LHR, ♂ AMNH, ♂ LSU); Los Brasiles, Managua, 19-VII-70 (b) L. H. Rolston (♂ LHR, ♂ TAMU); La Calera, Managua, 21-VII-70 (b) L. H. Rolston (♀ TAMU, ♀ AMNH); Peña Blanca, Rivas, 24-VII-70 (b) L. H. Rolston (♂ CAS, ♂ BMNH, ♂ LHR); Nagarote, Leon, 22-VII-70 (b) L. H. Rolston (♂, ♀ OSU, ♂, ♀ MSU, ♂ UNLP); Leon, Leon, 23-VII-70 (b) L. H. Rolston (♀ AMNH, ♀ LSU, ♀ CAS, 2 ♀♀ BMNH, ♂, ♀ ICN, ♂, ♀ NR, ♂, ♀ UZM, ♀ UNLP).

DISTRIBUTION: Costa Rica, Nicaragua, Honduras. Specimens from Honduras and Costa Rica were seen only recently and are not included among the paratypes.

COMMENT: This species is common in western Nicaragua, infesting various weeds and occasionally the seed or fruit of cultivated crops. The entire ventral surface is a bright green in life, gradually turning yellow in pinned specimens. Individuals with spinose humeri are the most common, numbering 33 of 42 specimens examined.

13, 75, 77 ***Euschistus strenuus* Stål, 1862** *T. 30-31*

Euschistus strenuus Stål, 1862, p. 100.—Distant, 1880, p. 60, Pl. 5 fig. 16 (type figured).

Euschistus zopilotensis Distant, 1890, p. 330, Pl. 31 fig. 9.—Ancona, 1933, p. 103 (morphology).—Van Duzee, 1904, p. 48 (record).

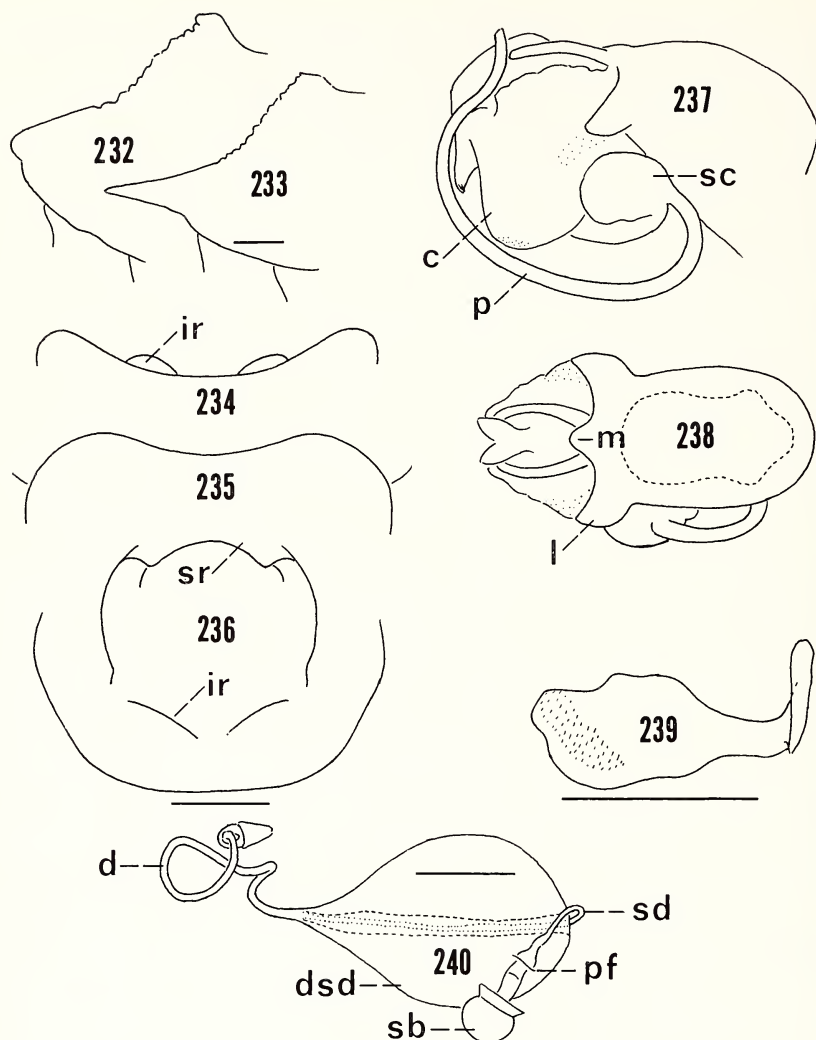
New Synonymy.

Length without membrane 6.9–8.7 mm. for males, 8.0–9.1 mm. for females; width at humeri 4.7–5.8 mm. for males, 5.0–5.9 mm. for females; length of antennal segments (both sexes) 0.5–0.6; 0.6–0.8; 0.9–1.2; 0.9–1.3; 1.1–1.3 mm.; pronotum 2.5–2.9 times as wide as long.

Humeri slightly produced and bluntly rounded to moderately produced and spinose (Figs. 241–242), palely colored with yellow, brown or red, never black. Vague broad fascia, more sparsely punctate and prominently to obscurely paler than adjacent surfaces, frequently running transversely from humeri to meson, there curving cephalad, passing between cicatrices and continuing along meson of head to apex of tylus.

Posterior margin of pygophore truncate from ventral view (Fig. 244); lateral walls of genital cup with small denticle entad of obtuse, rather obscure production on rim of genital cup (Fig. 245). Penis-filum short, curving basad upon emerging from sclerotized cap (Fig. 246). Cephalic margin of parameres smoothly convex (Fig. 248).

Spermathecal duct of female genitalia quite short from orifice to



FIGS. 232-240. *E. leonensis*. Figs. 232-233. Variation in humeral angle. Fig. 234. Posterior margin of pygophore, caudal aspect; inferior ridge (ir). Fig. 235. Posterior margin of pygophore, ventral aspect. Fig. 236. Genital cup, dorsal aspect, omitting parameres and proctiger; inferior ridge (ir), superior ridge (sr). Fig. 237. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 238. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 239. Right paramere,

dilation, looped but not convolute before proximal flange (Fig. 250); spermathecal bulb nearly hemispherical.

TYPE: Female, in Signoret collection, Naturhistorisches Museum, Vienna, Austria. Stål gave the width of the type as 4 mm., but Dr. R. C. Froeschner found the specimen to measure 5.2 mm. at the humeri, a figure in agreement with Distant's dimensional diagram beside his illustration of the type.

SYNONYMY: Distant in his description of *E. zopilotensis* stated: "In structure and shape allied to *E. strenuus* Stål, but with the pronotal angles subprominent and obtusely rounded, not prominent and subacute; the lateral margins of the pronotum are not levigate as in Stål's species, and the colour is also different." All of these characters prove to be variable, and the genitalia of the form described by Stål and that of Distant's syntypes appear identical. The color of the tergites beneath the membrane correlate with the form of the humeri, however. Of 54 specimens with bluntly rounded to obtusely angulate humeri, the tergites of 52 (96%) were light brown to black and darker than the venter; of 37 specimens with acute to spinose humeri, the tergites of only 12 (32%) were similarly colored.

One of Distant's 10 syntypes, a female, is not conspecific with the other syntypes. This specimen bears a 'type' label, presumably added later since Distant did not designate type specimens. Although the specimen bears only a superficial resemblance to the other syntypes, it is probably the object of Distant's comment that "... in some specimens the punctures become confluent and form irregular spots and patches of black."

The syntypic specimens of *Euschistus zopilotensis* Distant, 1890, consist of 7♂♂ and 2♀♀. From these the following is designated the lectotype:

♂, labeled (a) Venta de Zopilote, Guerrero, 2800 ft. June, H. H. Smith (b) Distant Coll. 1911-383.

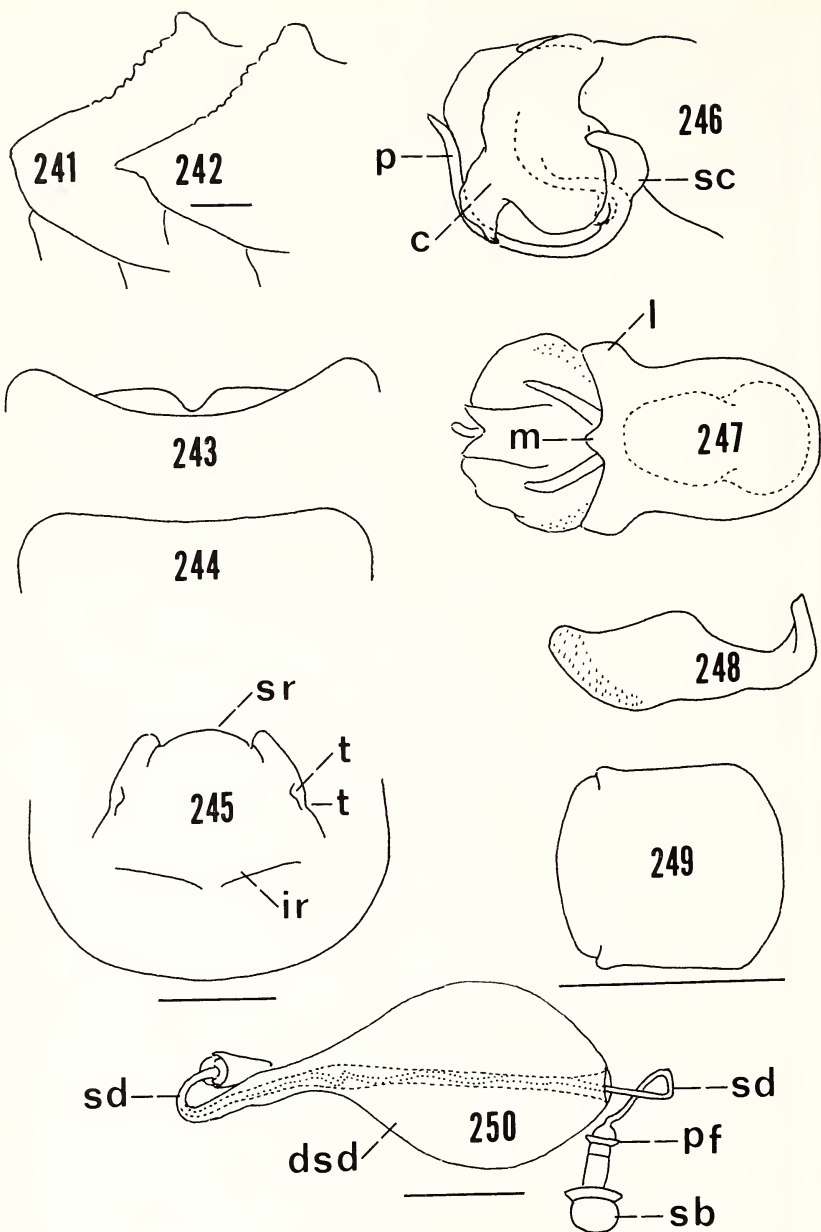
Six ♂♂ and 2 ♀♀ are designated paralectotypes:

1-3. ♂♂, (a) Venta de Zopilote, Guerrero, 2800 ft. Oct. H. H. Smith (b) B.C.A. Hem. I, *Euschistus zopilotensis*.

4-5. ♂ and ♀, (a) Venta de Zopilote, Guerrero, 2800 ft. June. H. H. Smith (b) Distant Coll. 1911-383.

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lateral aspect. Fig. 240. Spermatheca; dilation of spermathecal duct (dsd), proximal flange (pf), spermathecal bulb (sb), spermathecal duct (sd). Dimensional lines equal 0.5 mm.



6. ♀, (a) Venta de Zopilote, Guerrero, 2800 ft. Oct. H. H. Smith (b) Distant Coll. 1911-383.
7. ♂, (a) Chilpancingo, Guerrero, 4600 ft. July. H. H. Smith (b) B.C.A. Hem. I, *Euschistus zopilotensis*.
8. ♂, (a) *zopilotensis* Dist. (b) Cuernavaca, Morelos, June. H. H. Smith (c) Distant Coll. 1911-383.

All types are in the British Museum (Natural History) London.

***Euschistus subinteger*, new species**

Yellowish brown above; moderately, rather regularly and lightly punctate with castaneous to black. Sordid yellow ventrally, concolorously punctate. Length 9.5 mm.

Head nearly as long as broad, 2.1-2.2 mm. wide across eyes; juga about as long as tylus, lateral margins tapering slightly from concavity before eyes to moderately rounded apex of head. Antennae finely dotted with fuscous on four basal segments (fifth wanting), segments 0.5; 0.9; 1.2; 1.5; ? mm. long. Bucculae evanescent at base of head, subequal in length to basal segment of rostrum.

Pronotum 2.1-2.4 mm. long at meson, 2.4-2.5 times as wide at humeri. Anterolateral margins straight, undulating or obscurely denticulate near apex, with or without denticle at anterolateral angle, anterior half or more slightly reflexed and with narrow impunctate border (Fig. 251). Humeri modestly produced, right angular. Disk shallowly impressed posterolaterad of cicatrices.

Scutellum subequal in length and breadth, 3.1-3.6 mm. wide at

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FIGS. 241-250. *E. strenuus*. Figs. 241-242. Variation in humeral angles. Fig. 243. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 244. Posterior margin of pygophore, ventral aspect. Fig. 245. Genital cup, dorsal aspect, omitting parameres and proctiger; inferior ridge (ir), superior ridge (sr), tubercle (t). Fig. 246. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 247. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 248. Right paramere, lateral aspect. Fig. 249. Proctiger. Fig. 250. Spermatheca; dilation of spermathecal duct (dsd), proximal flange (pf), spermathecal bulb (sb), spermathecal duct (sd). Dimensional lines equal 0.5 mm.

base; basal angles with cluster of a few black punctures; apex indistinctly pale margined; punctation of disk uniform to somewhat irregular with a few lacunae and spots of accretive black punctures. Membrane of hemelytra frosty hyaline; veins simple or furcate, brownish. Connexiva alternated, brownish yellow with black band bordering sutures on each side. Tergites black.

Pleural surfaces on each side with five black spots, otherwise unmarked. Femora, sometimes tibiae also, sparsely black spotted. Margins of abdominal venter black at both basal and apical angles. Spiracles concolorous with sternites.

Pygophore with broad, moderately deep, mesial emargination of posterior margin in ventral and dorsal views (Figs. 253, 254); sinusously concave in caudal view with broad median concavity flanked on each side by lesser concavity (Fig. 252). Inferior ridge apparently incorporated into posterior margin of pygophore, forming thin mesial portion; lateral walls of genital cup adorned with series of subvertical black rugae becoming denticulate entad. Superior ridge notched mesially. Preapical tubercles on proctiger well developed (Fig. 255). Parameres shallowly cupped, terminating in simple hook with slightly roughened area on inner face (Fig. 258). Two small appendages on each side of conjunctiva, both sclerotized at acute apex (Fig. 256). Penisfilum with annular sclerotized cap at base. Lateral lobes of theca prominent, surpassing median lobe (Fig. 257).

HOLOTYPE: Female, labeled, Mexico, Tepic, 22 Aug. 1905, P. H. Goldsmith. Deposited in American Museum of Natural History.

PARATYPE: Male, Mexico, Oaxaca nr. Totolapan, Aug. 5, 1965, Flint & Ortiz (USNM).

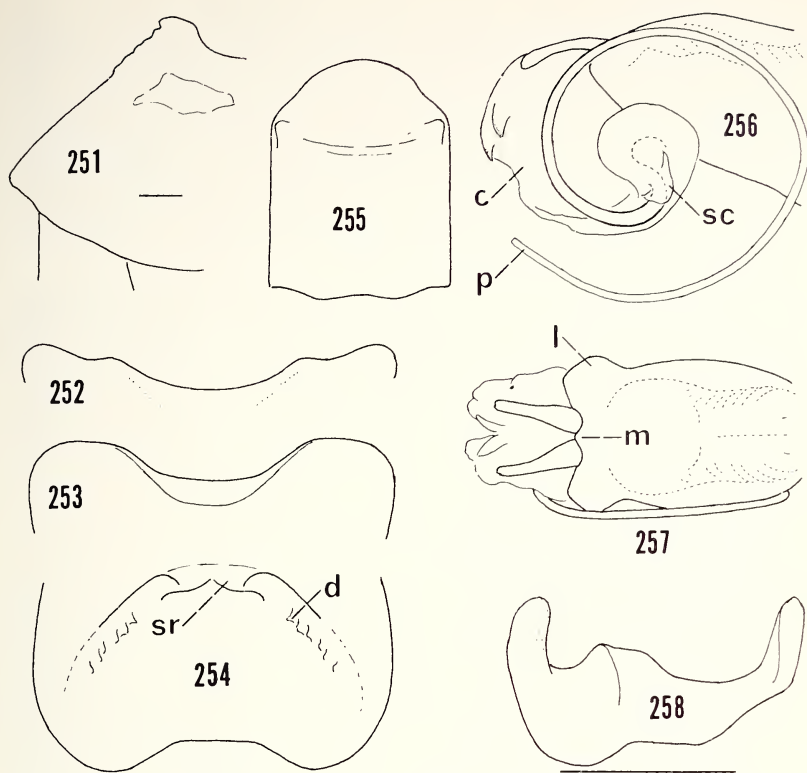
DISTRIBUTION: Mexican states of Oaxaca and Nayarit.

COMMENT: This species closely resembles *E. integer* but, in addition to the distinctive male genitalia, differs in having the anterolateral margins of the pronotum quite straight and the humeri angulate, while in *E. integer* the margin is usually slightly arcuate and completely smooth, and the humeri are always rounded.

The paratype is unfortunately in poor condition, lacking all the antennae except one basal segment and most of the legs.

SULCACITUS GROUP

The *sulcatus* group consists of four species: *Euschistus corcovatus*, *E. olacitus*, *E. palacitus* and *E. sulcatus*. Their nearest relatives are the species comprising the *crenator* group and the *strenuus* group.



FIGS. 251-258. *E. subinteger*. Fig. 251. Pronotum. Fig. 252. Posterior margin of pygophore, caudal aspect. Fig. 253. Posterior margin of pygophore, ventral aspect. Fig. 254. Genital cup, dorsal aspect; denticles (d), superior ridge (sr). Fig. 255. Proctiger. Fig. 256. Theca and related structures, lateral aspect; conjunctiva (c), penis-filum (p), sclerotized cap (sc). Fig. 257. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Fig. 258. Right paramere. Dimensional lines equal 2.5 mm.

GROUP CHARACTERISTICS

Relatively small, males 7.7-9.1 mm. long. Punctuation of dorsum rather uniform, moderately dense, castaneous, usually darker along lateral margins of head, becoming black along anterolateral pronotal margin, without impunctate fascia or calloused spots. Anterolateral pronotal margins closely denticulate about three-fifths distance from

apex to humeral angles with punctures encroaching between and sometimes onto base of denticles; humeral angles narrowly rounded (Fig. 259), usually slightly elevated in transverse profile (Fig. 260), generally tinged with red. Costal margin of hemelytra not reflexed, disk without dark spots, membrane unspotted, vitreous or nearly so; veins simple or furcate. Ventral surfaces including evaporative areas, abdominal sutures and spiracles, pale excepting five black spots on each side of thorax and black spot at basal angles of abdominal sternites; punctation concolorous.

Posterior margin of inferior ridge, viewed dorsally, forming shallow concave arc (Figs. 263, 271, 277, 283). Superior ridge sinuously produced above proctiger (Fig. 264). Penisfilum with sclerotized cap at base. Appendage on each side of conjunctiva sclerotized and acute at apex (Figs. 266, 273, 279, 285). Lateral lobes of theca produced little or not at all laterally (Figs. 267, 274, 280, 286).

1481 **Euschistus corcovacitus** Rolston, 1971

Euschistus corcovacitus Rolston, 1971, p. 486.

Posterior margin of pygophore shallowly concave and sinuous in caudal view (Fig. 261), somewhat protruding mesially in ventral view (Fig. 262), convexly arcuate in dorsal view (Fig. 263). Area behind inferior ridge smoothly excavated excepting low broad mesial protuberance. Carina on lateral walls of genital cup with small black obtuse denticle anterolaterad of parameres. Parameres broadly rounded at apex of obovate shagreened area (Fig. 265).

TYPE: Male, in American Museum of Natural History.

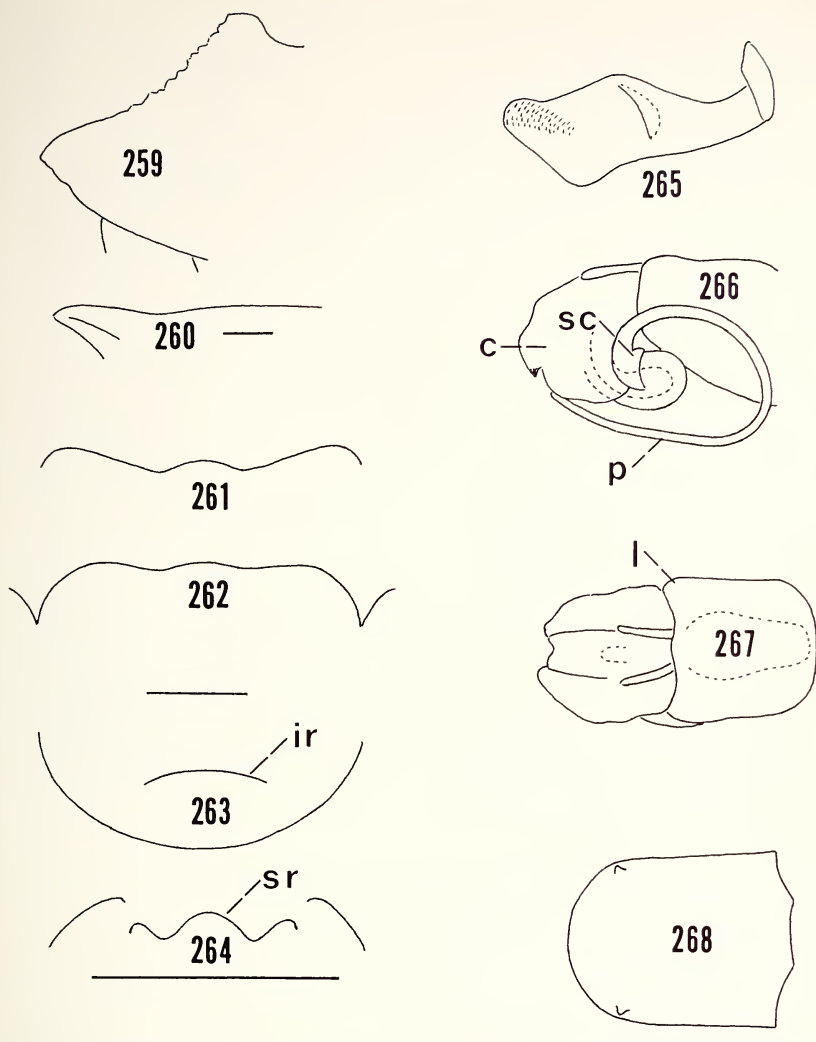
DISTRIBUTION: Costa Rica, Guatemala, Honduras, and Chiapas, Mexico.

1482, 82' **Euschistus olacitus** Rolston, 1971

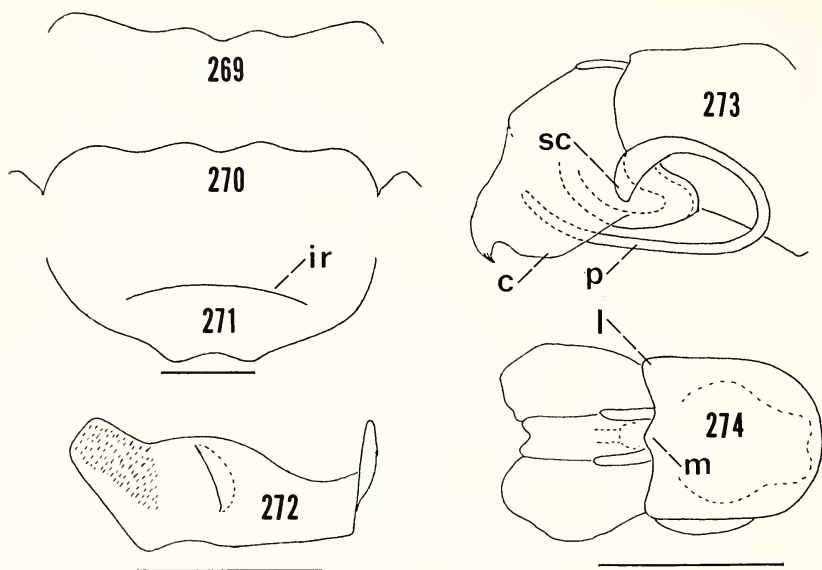
Euschistus olacitus Rolston, 1971, p. 486.

Posterior margin of pygophore slightly concave and conspicuously sinuous in caudal view (Fig. 269), quite sinuous in ventral view (Fig. 270), convexly arcuate with sinuous mesial protuberance in dorsal view (Fig. 271). Area behind inferior ridge smoothly excavated. Black percurrent carina on lateral walls of genital cup anterolaterad of parameres. Parameres truncate at apex of subtrapezoidal shagreened area (Fig. 272).

TYPE: Male, Type No. 71965, U. S. National Museum.



FIGS. 259-268. *E. corcovacitus*. Fig. 259. Pronotum. Fig. 260. Dorsal profile of pronotum, cephalic aspect. Fig. 261. Posterior margin of pygophore, caudal aspect. Fig. 262. Posterior margin of pygophore, ventral aspect. Fig. 263. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 264. Posterior margin of superior ridge (sr). Fig. 265. Right paramere, lateral aspect. Fig. 266. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 267. Theca and related structures, dorsal view. Fig. 268. Proctiger. Dimensional lines equal 0.5 mm.



FIGS. 269–274. *E. olacitus*. Fig. 269. Posterior margin of pygophore, caudal aspect. Fig. 270. Posterior margin of pygophore, ventral aspect. Fig. 271. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 272. Right paramere, lateral aspect. Fig. 273. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 274. Theca and related structures, dorsal aspect; lateral lobes (l), median lobe (m). Dimensional lines equal 0.5 mm.

DISTRIBUTION: In Mexican states of Hidalgo, Oaxaca, San Luis Potosí and Vera Cruz.

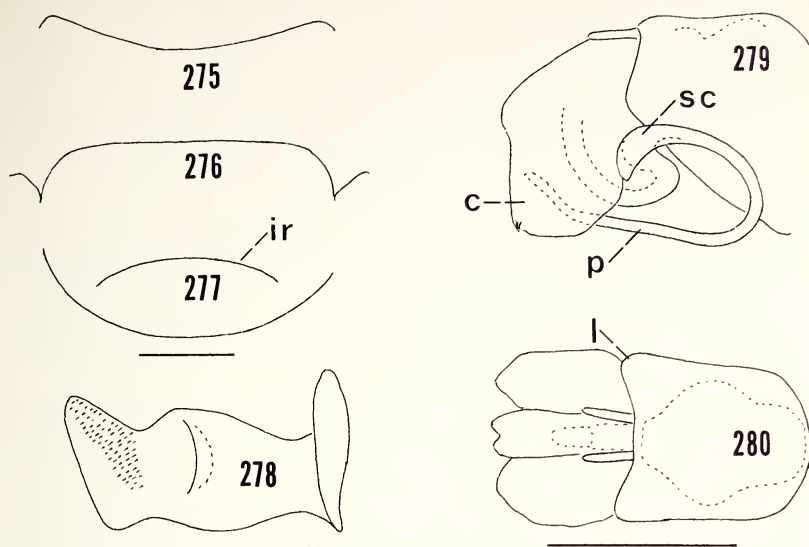
Euschistus palacitus Rolston, 1971

Euschistus palacitus Rolston, 1971, p. 487.

Posterior margin of pygophore concavely arcuate in caudal view (Fig. 275), nearly straight in ventral view (Fig. 276), convexly arcuate in dorsal view (Fig. 277). Genital cup smoothly excavated between inferior ridge and posterior margin of pygophore. Small black denticle anterolaterad of parameres on carina of lateral walls of genital cup. Parameres toward apex bent laterad, appearing abbreviated in lateral view (Fig. 278).

TYPE: Male, in American Museum of Natural History.

DISTRIBUTION: Guatemala.



FIGS. 275–280. *E. palacitus*. Fig. 275. Posterior margin of pygophore, caudal aspect. Fig. 276. Posterior margin of pygophore, ventral aspect. Fig. 277. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 278. Right paramere, lateral aspect. Fig. 279. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 280. Theca and related structures, dorsal aspect; lateral lobes (l). Dimensional lines equal 0.5 mm.

Euschistus sulcatus Rolston, 1971

Euschistus sulcatus Rolston, 1971, p. 488.

Posterior margin of pygophore with broad shallow notch in caudal view (Fig. 281), slightly sinuous in ventral view (Fig. 282), convexly arcuate in dorsal view (Fig. 283). Broad mesial sulcus in excavation behind inferior ridge flanked by slight thickening of posterior margin of pygophore. Carina on lateral walls of genital cup with small black denticle anterolaterad of parameres. Parameres broadly rounded at apex of elongated shagreened area (Fig. 284). Penisfilum appreciably longer than in other species of group (Fig. 285).

TYPE: Male, Type No. 71966, U. S. National Museum.

DISTRIBUTION: Guatemala to Mexican state of San Luis Potosí.

810 **Euschistus tristigmus** (Say), 1832 — 293
291-294

Pentatoma tristigma Say, 1832, p. 4.—Say, 1859, p. 314.

Pentatoma inconspicuum [Westwood], 1837, p. 42.

Cimex pyrrhocera Herrich-Schaeffer, 1841, p. 42, fig. 638.

Pentatoma tristigma Herrich-Schaeffer, 1844, pp. 95, 101, fig. 767 (as new species).

Euschistus luridus Dallas, 1851, p. 207, Pl. 7 fig. 6.

Euschistus tristigma: Dallas, 1851, p. 207.

Euschistus tristigmus: Stål, 1872, p. 26.—Distant, 1880, p. 58, Pl. 5 figs. 20, 21.—Van Duzee, 1904, p. 47.—Blatchley, 1926, p. 134 (description).—Woodside, 1946, p. 161 (biology).—Esselbaugh, 1949, p. 160 (biology).—McDonald, 1966, p. 28, figs. 246–250, 452 (genitalia).—Schaefer, 1968, p. 89 (female genitalia).—McPherson, 1971, p. 1339 (biology).

Euschistus tristigmus luridus: Blatchley, 1926, p. 136.

Euschistus tristigmus pyrrhocerus: Van Duzee, 1904, p. 47 (as variety).—Kirkaldy, 1909, p. 67 (as variety).—Blatchley, 1926, p. 137.

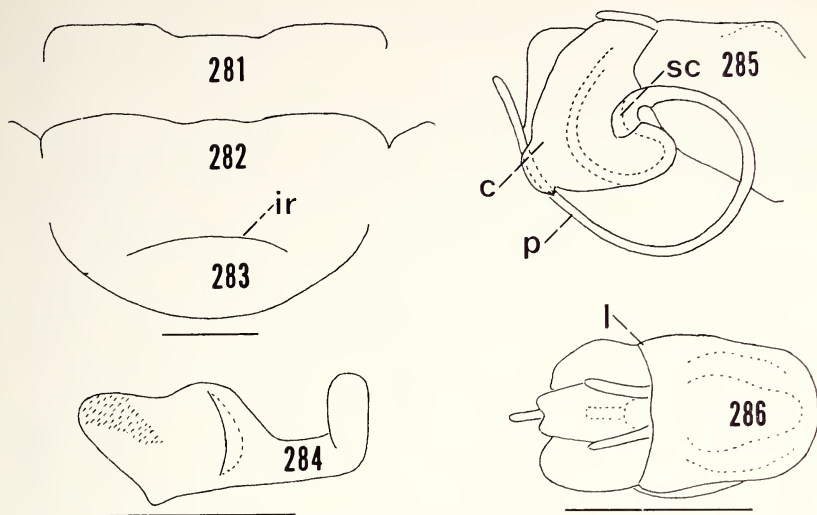
Light brown to fuscous above, thickly and rather uniformly punctate with castaneous to black, ventral surfaces sordid white to pale yellow, concolorously punctate or with some punctures and flecks of pale red. Length 9.2–12.3 mm.

Width of head equal to or slightly greater than length, 2.0–2.5 mm. across eyes; lateral margins subparallel for middle third of distance from eyes to broadly rounded apex; disk nearly flat. Antennae pale yellow to rufous, rarely fuscous on apical half of fourth and all of fifth segments; often basal segment, occasionally second and third also, sparsely marked with faint dark dots; length of segments 0.6–0.7; 0.7–1.1; 1.0–1.5; 1.2–1.6; 1.4–1.7 mm. Bucculae evanescent at base of head.

Pronotum 2.0–3.0 mm. long at meson, 2.6–3.1 times as wide at humeri. Apical half of anterolateral margins closely denticulate; denticles concolorous with or somewhat paler than disk; submarginal punctation especially dense. Humeri moderately to strongly produced, obtusely rounded to acute, slightly to moderately elevated (Figs. 287, 288).

Width and length of scutellum subequal, 3.1–4.4 mm. wide at base; basal angles with small fovea; apex narrowly rounded, sometimes narrowly impunctate and flavous. Membrane of hemelytra hyaline, with numerous brownish spots; veins simple, with little or no color. Connexiva fuscous to black, alternated with sordid white to orange brown at middle of each segment.

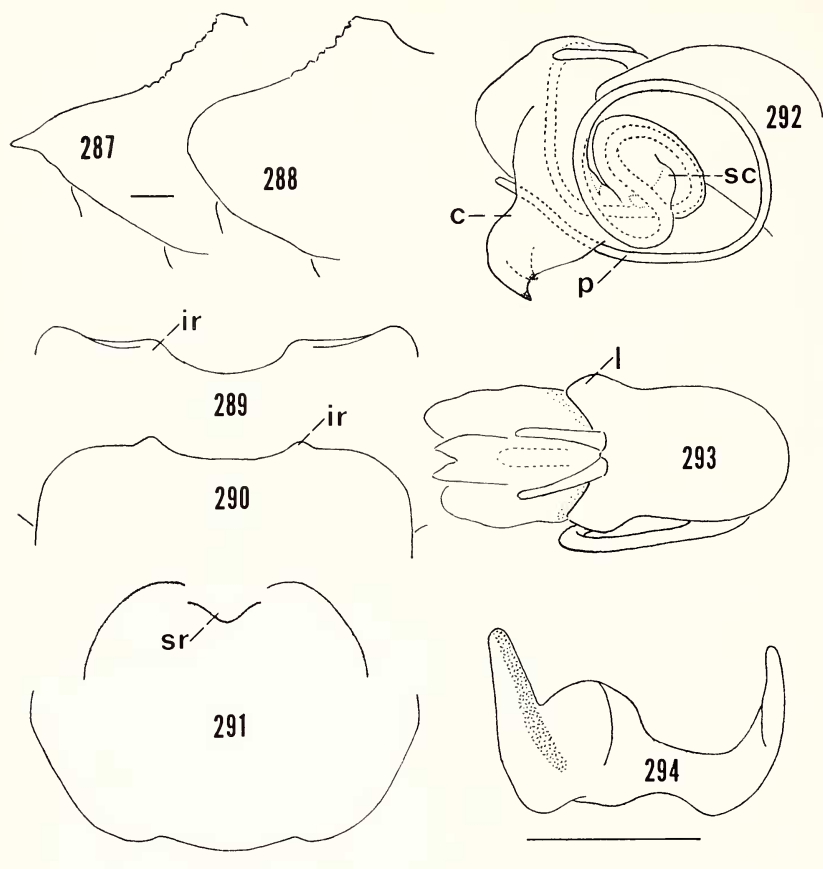
Pleural surfaces on each side with five black spots. Mesosternum with fuscous macula at base of each coxa, anterior pair rarely want-



FIGS. 281–286. *E. sulcatus*. Fig. 281. Posterior margin of pygophore, caudal aspect. Fig. 282. Posterior margin of pygophore, ventral aspect. Fig. 283. Posterior margin of pygophore and of inferior ridge (ir), dorsal aspect. Fig. 284. Right paramere, lateral aspect. Fig. 285. Theca and related structures, lateral aspect; conjunctiva (c), penis-filum (p), sclerotized cap (sc). Fig. 286. Theca and related structures, dorsal aspect; lateral lobes (l). Dimensional lines equal 0.5 mm.

ing. Legs rather thinly spotted with blackish dots of various sizes, some grouped on femora in vague preapical ring. Evaporative areas not contrastingly punctate, occasionally flecked with pale red. Spiracles concolorous with supporting sclerites. Lateral margins of abdomen dotted with black at basal angles of each sternite, less extensively so at apical angles. Elongate black median macula on fifth sternite, rarely faded to obscurity, usually accompanied by similar macula on each of one to three preceding sternites.

Inferior ridge forms angular U open at posterior margin of pygophore, its apices in caudal view appearing as ridges dividing posterior margin of pygophore into three concave parts (Fig. 289), protruding slightly from ventral view, interrupting shallowly concave posterior margin of pygophore (Fig. 290). Superior ridge produced posteriorly above protiger into mesial, entire, occasionally quite prolonged tubercle (Fig. 291). Conjunctiva with two appendages on each side, both acute and sclerotized at apex (Fig. 292). Penisfilum coiled, making about one and one half loops, with sclerotized cap



FIGS. 287-294. *E. tristigmus*. Figs. 287-288. Variation in humeral angle. Fig. 289. Posterior margin of pygophore and dorsal margin of inferior ridge (ir), caudal aspect. Fig. 290. Posterior margin of pygophore, ventral aspect; inferior ridge (ir). Fig. 291. Outline of genital cup, dorsal aspect; superior ridge (sr). Fig. 292. Theca and related structures, lateral aspect; conjunctiva (c), penisfilum (p), sclerotized cap (sc). Fig. 293. Theca and related structures, dorsal aspect; lateral lobes (l). Fig. 294. Right paramere, lateral aspect.

at base. Lateral lobes of theca prominent (Fig. 293). Apex of parameres strongly bent in lateral view, rather acute, reticulate on cephalic surface (Fig. 294).

TYPE: The type of *E. tristigmus* is apparently lost. The type of *E. luridus* Dallas was examined.

DISTRIBUTION: Primarily a northern species but may occur in northern Mexico.

12, 31 ***Euschistus vetus***, new species

Yellowish brown above with broad, light suffusion of red on head and lateral borders of pronotum and hemelytra. Margins of head before eyes thinly edged with black. Narrow black band composed of black punctures along denticulate portion of pronotum continuing onto humeral angles as nearly solid line with diffuse inner boundary; punctuation rather evenly distributed, moderately dense, fuscous. Ventral surfaces paler than dorsum, concolorously punctate. Length 9.1–10.3 mm.

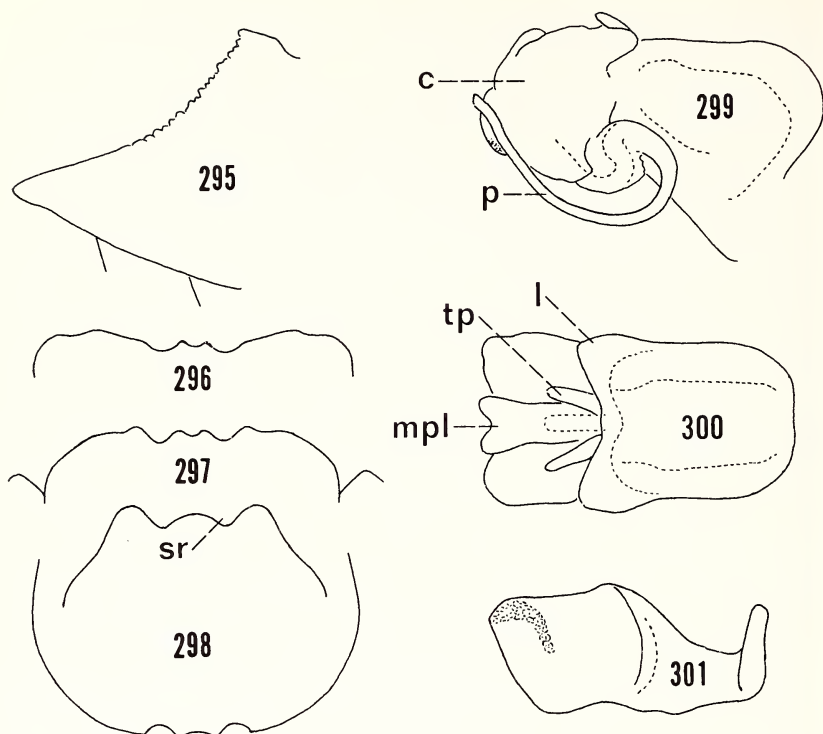
Length and breadth of head through eyes subequal, 1.9–2.1 mm. wide; apex of head narrowly rounded, tylus and juga subequal in length; lateral margins of juga subparallel for about middle third of distance from eyes to apex. Basal segment of antennae reaching apex of head; length of segments 0.5–0.7; 0.7–1.0; 1.2–1.5; 1.4–1.7; 1.4–1.8 mm.; entirely brown, sometimes paler toward base of last two segments, variably dotted with light fuscous on basal or three basal segments. Bucculae evanescent at base of head, subequal in length to basal segment of rostrum.

Pronotum 2.2–2.6 mm. long at meson, 2.6–3.1 times as wide at humeri. Anterolateral margins concavely arcuate, closely denticulate nearly to humeral angles (Fig. 295); denticles black in whole or part. Humeral angles rather strongly produced laterad, rising toward apex, spinose.

Scutellar width and length subequal, 3.5–3.8 mm. wide at base; basal disk transversely rugose, sometimes moderately tumose; basal fovea in each angle small, consisting of a few confluent punctures, usually no darker than other punctures of scutellum; apex not differentially colored, punctuation a little finer than on remainder of scutellum. Membranes of hemelytra slightly fumose; veins simple or furcate. Connexiva narrow to moderately wide, narrowly bordered with black except in middle of each segment, slightly serrate; punctuation dense, shallow, rather fine.

Pleural surfaces with five small black spots on each side, that beneath apical pronotal angle minute, sometimes absent. Evaporative areas uniformly colored. Small fuscous spots numerous on femora and tibiae. Basal angles of abdominal sternites marked with elongated black spot; apical angles minutely blackened at very apex. Spiracles concolorous with supporting sclerite.

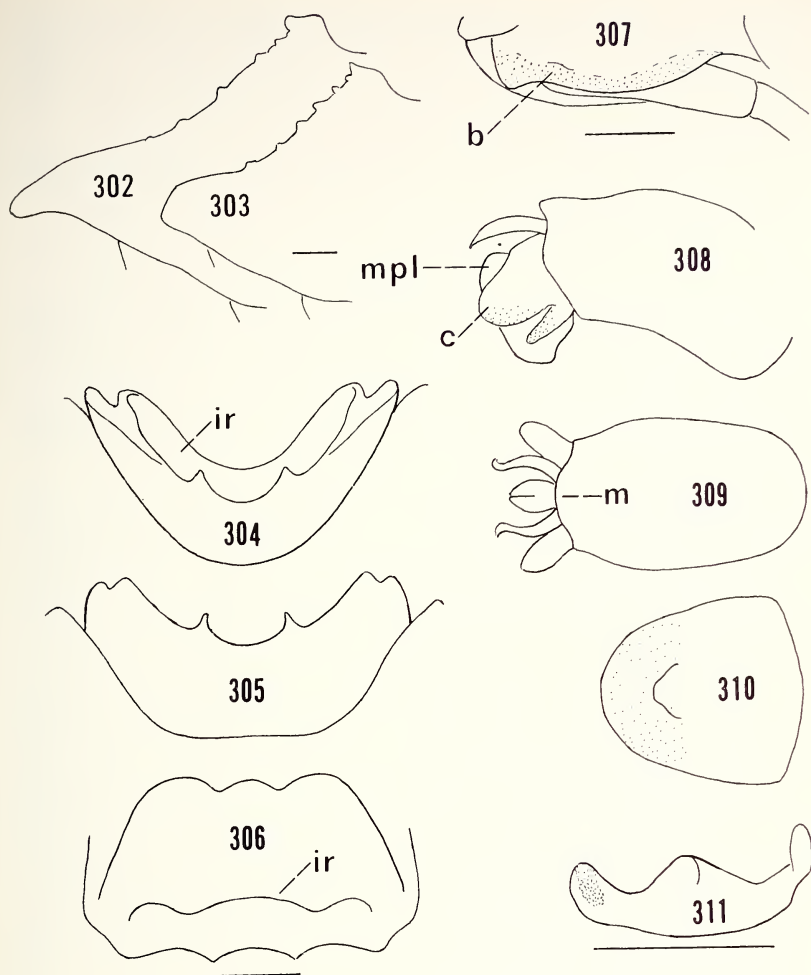
Narrow shallow median emargination of posterior margin of



FIGS. 295-301. *E. vetus*. Fig. 295. Pronotum. Fig. 296. Posterior margin of pygophore, caudal aspect. Fig. 297. Posterior margin of pygophore, ventral aspect. Fig. 298. Genital cup, dorsal aspect, with proctiger and parameres removed; superior ridge (sr). Fig. 299. Theca and related structures, right lateral aspect; conjunctiva (c), penisfilum (p). Fig. 300. Theca and related structures, dorsal aspect; lateral lobes (l), median penal lobes (mpl), thecal processes (tp). Fig. 301. Right paramere, lateral aspect.

pygophore flanked on each side by somewhat deeper emargination (Figs. 296-298). Appendage on each side of conjunctiva sclerotized at apex (Fig. 299). Penisfilum without clearly defined sclerotized cap. Lateral lobes of theca well developed, median lobe obscure (Fig. 300). Thecal processes rather short, about half as long as median penal lobes. Paramere moderately cupped, with reticulate ridge on lateral apical surface (Fig. 301).

HOLOTYPE: Male, labeled, (a) La Fuente, Costa Rica, VIII-20-1929, A. Alfaro (b) J. C. Lutz Collection, 1961. Basal



FIGS. 302-311. *E. zafadus*. Figs. 302-303. Variation in humeral angle.

Fig. 304. Posterior margin of pygophore, caudal aspect; inferior ridge (ir). Fig. 305. Pygophore, ventral aspect. Fig. 306. Genital cup, dorsal aspect, with proctiger and parameres removed. Fig. 307. Bucculae (b) and basal segment of rostrum. Fig. 308. Theca and related structures, right lateral aspect; conjunctiva (c) median penal lobes (mpl). Fig. 309. Theca and related structures, dorsal aspect; median lobe (m). Fig. 310. Proctiger. Fig. 311. Right paramere, lateral aspect. Dimensional lines equal 0.5 mm.

margin of pronotum deformed on right side. Type No. 72130. U. S. National Museum.

PARATYPES: 3 ♀ ♀, same data as holotype (USNM, TAMU, LHR).

DISTRIBUTION: Costa Rica.

COMMENT: This species is much like large specimens of the *crenator* group that have acute humeral angles.

***Euschistus zafadus*, new species**

Dark rusty brown above, shading to fuscous along anterolateral margins of pronotum and on head; punctation rather dense and coarse, especially on pronotum and scutellum. Pale orange brown beneath; rather sparsely punctate with castaneous to fuscous, with large black median spot on each of last three or four abdominal sternites.

Width of head through eyes and length subequal, 1.9–2.2 mm.; apex somewhat truncate, tylus and juga individually rounded, subequal in length; lateral margins of juga subparallel for middle third of distance from eyes to apex; disk rugosely punctate. Basal segment of antennae sordid yellow streaked with fuscous on lateral surface; remaining segments fuscous excepting sordid yellow at joints and on basal fourth of last segment; length of segments 0.5–0.7; 0.9–1.2; 1.0–1.4; 1.5–2.0; 1.7–2.0 mm.; basal segment reaching apex of head. Bucculae evanescent at base of head; basal segment of rostrum surpassing bucculae by about width of segment at apex (Fig. 307).

Pronotum 2.3–2.9 mm. long at meson, 2.7–3.1 times as wide at humeri. Denticles along anterolateral margins fuscous, as few as four on one side but usually 6–9. Humeri strongly produced laterad, rising well above disk, curving caudad near apex, with polished, yellowish, narrowly rounded apex (Fig. 302); or moderately produced, little elevated, with apical marking much reduced (Fig. 303); disk usually divided along meson by thin ruga of paler color.

Scutellum subequal in length and width, 3.2–4.1 mm. across base; small fovea in each basal angle subtriangular; apex slightly reflexed on each side of median depression. Membrane of hemelytra brown; veins simple or furcate; pale subcalloused spot located at distal end of radial vein on coria. Connexiva moderately exposed, fuscous alternated with pale spots concolorous with venter, these spots in middle of each segment along lateral border and becoming progressively larger toward apex of abdomen.

Pleura with black spot at base of subcoxae excepting sometimes on metapleura; sometimes additional spot present at anterior margin

of mesopleura; evaporative areas darkly punctate. Legs concolorous with venter, with large fuscous spots often coalescing. Spiracles black. Abdominal sternites each with black line along lateral margins at basal angles. Median black spot near base of each of last three or four abdominal sternites increasingly larger and more longitudinally elongate toward apex of abdomen.

Posterior margin of pygophore deeply and broadly concave in caudal view, interrupted on each side of meson by large denticle, approximately paralleled by dorsal margin of inferior ridge (Fig. 304); less deeply concave in ventral view, denticles prominently displayed, notched at posterolateral corners (Fig. 305); trisinuately truncate in dorsal view (Fig. 306). Large median tubercle on proctiger preapical; distal portion of proctiger from base of tubercle and tubercle heavily pigmented (Fig. 310). Parameres shallowly cupped, with reticulated patch on lateral surface at apex (Fig. 311). Conjunctiva extensively pigmented apically, ventral appendage almost entirely so (Fig. 308). Broad median lobe of theca nearly hyaline (Fig. 309). Penisfilum obscured except in caudal view by surrounding median penal lobes.

HOLOTYPE: Male, labeled, Collection Schild-Burgdorf, Costa Rica, Turcurrique. Type No. 72126, U. S. National Museum.

PARATYPES: 2 ♂♂, 3 ♀♀. BRITISH HONDURAS: (a) Rio Grande, VIII-1931, J. J. White (b) J. C. Lutz Collection, 1961 (♂ BMNH); same data (♂ LHR). COSTA RICA: (a) Estrella Valley, April 1924 (b) H. W. Atkinson (♀ TAMU); (a) Tucurrique (sic) (b) Schild-Burgdorf (♀ USNM). NICARAGUA: Collection Schild-Burgdorf, Costa Rica, San Carlos (♀ USNM) [San Carlos is in Nicaragua, at the southern end of Lake Nicaragua, near the Costa Rican border].

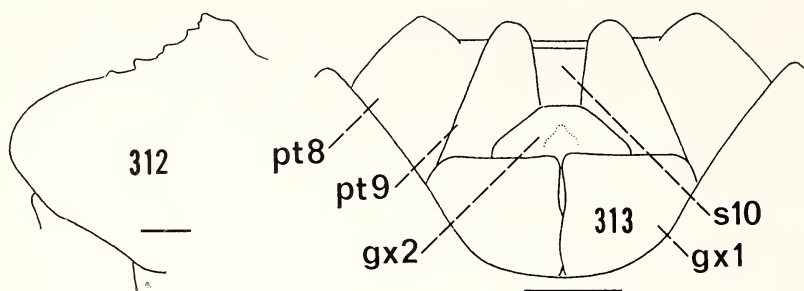
DISTRIBUTION: Costa Rica, Nicaragua, British Honduras.

COMMENT: The median depression and reflexed margins at the very apex of the scutellum is unique among *Euschistus* from Middle America, although present in several South American species of the genus. The cornute humeri of most specimens, with their polished, yellowish apex, and the median row of black spots on the abdominal venter aid in the recognition of this species.

***Euschistus zagus*, new species**

Dorsum gray, with moderately dense and somewhat irregularly disposed castaneous to black punctures. Pale sordid yellow beneath with concolorous or rufous punctures. Length without membranes 9 mm.

Length and breadth of head equal, 2.1 mm. Lateral margins of



FIGS. 312–313. *E. zagus*. Fig. 312. Pronotum. Fig. 313. Female genital plates; first gonocoxa (gx1), second gonocoxa (gx2), eighth paratergite (pt8), ninth paratergite (pt9), tenth sternite (s10). Dimensional lines equal 0.5 mm.

juga subparallel for middle third of distance from eyes to broadly rounded apex. Tylus and juga subequal in length. Disk gently elevated at vertex, slightly impressed anteromesad of eyes, otherwise nearly flat. Fuscous to black dots sprinkled on antenniferous tubercles and basal three segments of antennae, apical two segments immaculate; basal segment sordid yellow, remaining segments rufous, basal segment not quite reaching apex of head, length of segments 0.5; 0.7; 1.0; 1.2; 1.3 mm. Bucculae evanescent at base of head, subequal in length to basal segment of rostrum.

Pronotum 1.8 mm. long at meson, 5.1 mm. wide across humeri. Anterior half of anterolateral margins coarsely denticulate (Fig. 312); denticles concolorous with disk, some with one or two black punctures. Broadly rounded humeri connected by finely punctate, subcalloused fascia. Pronotal disk moderately impressed posterolaterad of cicatrices before fascia.

Scutellar width and length subequal, 3.6 mm. wide by 3.5 mm. long; fovea in each basal angle consisting of a few contiguous punctures; apex moderately rounded, lightly punctate, little paler than disk. Vitreous membrane of hemelytra becoming brown at inner angle, with numerous small dark spots; veins few, simple. Narrowly exposed connexiva concolorous with hemelytra between black bands on each side of sutures.

Pleural surfaces of thorax with fixe black spots. Fuscous mottling covers evaporative areas. Castaneous to fuscous spots on legs mostly of moderate size on femora, small on tibiae. Spiracles black, also generous spot at basal angles, small spot on apical angles, and small longitudinally elongate median macula on sixth sternite.

Right first gonocoxa overlapping left at base; posterior margins of both forming nearly straight, transverse line; median and posterior margins of each subequal (Fig. 313). Second gonacoxae subtriangular, truncate apically between ninth paratergites; tenth sternite trapezoidal, a little narrower at base than at apex. Apices of ninth paratergites slightly exceeded by eighth paratergites.

HOLOTYPE: Female, labeled, (a) Type (b) Chilpancingo, Guerrero, 4600 ft. July. H. H. Smith (c) B.C.A. Hem. I, *Euschistus zopilotenses* (d) Brit. Mus. Type No. Hem. 1037. This specimen is one of the syntypes of *Euschistus zopilotensis* Distant.

PARATYPES: None.

DISTRIBUTION: Guerrero, Mexico.

COMMENT: The fuscous mottling of the evapaporative areas and macula on the sixth abdominal sternite may be artifacts, although the surfaces appear clean and no obvious discoloration is present elsewhere on the specimen. It is probable that the rufous flecking on the ventral surfaces will prove to be inconstant.

This species bears a superficial resemblance to *E. obscurus* in shape and size, and especially because of the pronotal fascia connecting the humeri. It differs conspicuously in the lighter color and absence of dark spots on the dorsum, in having black spiracles and spotted membranes, and in the construction of the genital plates.

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LITERATURE CITED

- ANCONA, H. L.
1933. Los jumiles de Cuautla, *Euschistus zopilotensis* Distant. *An. Inst. Biol. Univ. Nac. Auton. Mex.* 4: 103-108.
- BARBER, H. G.
1906. Hemiptera from southwestern Texas. *Museum of the Brooklyn Institute of Arts and Sciences, Scientific Bulletin* 1: 262-263.
1914. Insects of Florida II. Hemiptera. *Bull. Am. Mus. Nat. Hist.* 33: 495-535.
1927. Two new species of Pentatomidae from the southern United States (Hemiptera-Heteroptera). *Bull. Brooklyn Entomol. Soc.* 22: 241-244.
- BARBER, H. G. AND S. C. BRUNER.
1932. The Cydnidae and Pentatomidae of Cuba. *Department of Agriculture of Puerto Rico, Journal* 16: 231-280, 3 pls.
- BECKER, M. AND J. GARZIA.
1970. Sobre os gêneros *Lopadusa* Stål e *Bothrocoris* Mayr (Hemiptera, Pentatomidae, Pentatomini) *Rev. Bras. Biol.* 30: 217-232.
- BLATCHLEY, W. S.
1926. Heteroptera or true bugs of eastern North America with special reference to the faunas of Indiana and Florida. Indianapolis, The Nature Publishing Co. 1116 pp.
- CHAPIN, J. B.
1959. The biology of *Euschistus obscurus* (Palisot de Beauvois). Louisiana State University, Master Thesis, 49 pp.
- DALLAS, W. S.
1851. List of the specimens of hemipterous insects in the collection of the British Museum. London. 2 pts. 592 pp. 15 pls.
- DISTANT, W. L.
1880-1892. Insecta. Rhynchota, Hemiptera-Heteroptera. In Godman, F. D., and O. Salvin, *Biologia Centrali-Americana*. London, Vol. 1, xx + 462 pp. 39 pls.
1887. Enumeration of the Van Volxem collection of Rhynchota contained in the Brussels Museum. Part. I. *Société Entomologique de Belgique, Compte-Rendu*. Series 3 no. 31, pp. 56-66.
1900. Contributions to a knowledge of Rhynchota II. Rhynchota of Central America. *Trans. R. Entomol. Soc. Lond.* (1900): 687-695.
- ESSELBAUGH, C. O.
1949. A bionomic note on the taxonomic status of the form *pyrrhocerus* of *Euschistus tristigmus* Say. *Proc. Entomol. Soc. Wash.* 51: 160-163.

FABRICIUS, J. C.

1794. Entomologia systematica emendata et aucta, secundum classes, ordines, genera, species, adjectis synonymis, locis, observationibus. Hafniae, Vol. 4, viii + 472 pp.

FOOTE, K. AND E. C. STROBELL.

1914. Results of crossing *Euschistus variolarius* and *Euschistus servus* with reference to inheritance of an exclusively male character. *J. Linn. Soc. London Zool.* 32: 337-373.

GRAZIA, J.

1968. Sobre o gênero *Chloropepla* Stål, 1867, com a descrição de uma nova espécie (Hemiptera, Pentatomidae, Pentatominae) *Rev. Bras. Biol.* 23: 193-206.

HERRICH-SCHAEFFER, G. A. W.

- 1836-1853. Die wanzenartigen Insecten. Nürnberg. Vols. 6(1841) and 7(1844).

JENSEN-HAARUP, A. C.

1922. Hemipterological notes and description II. *Entomol. Medd.* 14: 1-16.

KIRKALDY, G. W.

1909. Catalogue of the Hemiptera (Heteroptera). Vol. I Cimicidae. Berlin. xl + 392 pp.

MCDONALD, F. J. D.

1966. The genitalia of North American Pentatomoidea (Hemiptera: Heteroptera). *Quaest. Entomol.* 2: 7-150.

MCPHERSON, J. E.

1971. Laboratory rearing of *Euschistus tristigmus tristigmus*. *J. Econ. Entomol.* 64: 1339-1340.

PALISOT DE BEAUVOIS, A. M. F. J.

- 1805-1821. Insectes recueillis en Afrique et en Amérique, dans les royaumes d'Oware et de Benin, à Saint-Dominique et dans les États-Unis pendant les années 1781-1797. Paris. 267 pp. 90 pls.

ROLSTON, L. H.

1961. Biology of the brown stink bug, *Euschistus servus* Say. *J. Kans. Entomol. Soc.* 34: 151-157.
1971. Four species of *Euschistus* from Mexico and Central America. *J. Kans. Entomol. Soc.* 44: 483-491.
1972. Two new species of *Euschistus* from the Middle Americas. *J. Ga. Entomol. Soc.* 7: 182-187.

SAILER, R. I.

1954. Interspecific hybridization among insects with a report on cross-breeding experiments with stink bugs. *J. Econ. Entomol.* 47: 377-383.

SAY, T.

1832. Descriptions of new species of heteropterous Hemiptera of North America. New Harmony. 39 pp.

1859. The complete writings of Thomas Say on the entomology of North America, with a memoir of the author by George Ord. Edited by John L. Leconte, New York. 2 vols.
- SCHAEFER, C. W.
1968. The homologies of the female genitalia in the Pentatomoidea (Hemiptera-Heteroptera). *J. N. Y. Entomol. Soc.* 76: 87-91.
- STÅL, C.
(1858) 1860. Bidrag till Rio Janeiro-traktens, hemiptera-fauna. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* 2(7): 1-84.
1862. Hemiptera mexicana enumeravit speciesque novas descripsit. *Entomologische Zeitung hrsg. von dem entomologischen Vereine zu Stettin* 23: 81-118.
1867. Bidrag till Hemipterernas Systematik. Conspectus generum Pentatomidum Americae. *Ofversigt af Kongliga Svenska Vetenskaps-Akademiens Förhandlingar* 24(7): 522-534.
1868. Hemiptera Fabriciana. Fabricianska hemipterarter, efter de i Köpenhamn och Kiel förvarade typexemplaren granskade och beskrifne I. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* 7(11): 1-148.
1872. Enumeratio hemipterorum II. *Kongliga Svenska Vetenskaps-Akademiens Handlingar* 10(4): 1-159.
- TORRE-BUENO, J. R. DE LA.
1939. A synopsis of the Hemiptera-Heteroptera of America north of Mexico. Part I. *Entomol. Am.* 19: 141-310.
- VAN DUZEE, E. P.
1904. Annotated list of the Pentatomidae recorded from America north of Mexico, with descriptions of some new species. *Trans. Am. Entomol. Soc.* 30: 1-80.
1907. Notes on Jamaican Hemiptera: A report on a collection of Hemiptera made on the island of Jamaica in the spring of 1906. *Bull. Buffalo Soc. Nat. Sci.* 8: 1-79.
- WALKER, F.
1867-1868. Catalogue of the specimens of Hemiptera-Heteroptera in the collection of the British Museum. Part II (1867), pp. 241-417. Part III (1868), pp. 418-599.
- WESTWOOD, J. O.
1837. *In* Hope, F. W., a catalogue of Hemiptera in the collection of the Rev. F. W. Hope, M. A. with short Latin diagnoses of the new species. Part I. London 46 pp.
- WOODSIDE, A. M.
1946. Life history studies of *Euschistus servus* and *E. tristigmus*. *J. Econ. Entomol.* 39: 161-163.